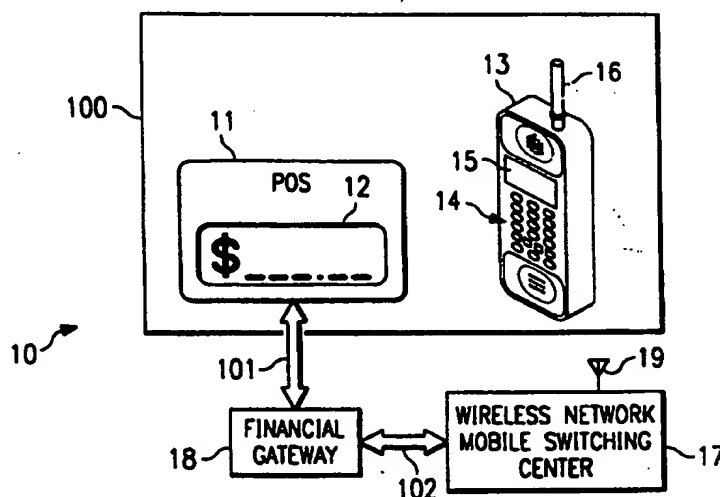




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup> :</b> <b>G07F 19/00, H04M 17/00</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 99/33034</b> <b>(43) International Publication Date:</b> 1 July 1999 (01.07.99)
<b>(21) International Application Number:</b> PCT/US98/26786 <b>(22) International Filing Date:</b> 16 December 1998 (16.12.98) <b>(30) Priority Data:</b> 08/997,489                      23 December 1997 (23.12.97)      US <b>(71) Applicant:</b> GLOBAL MOBILITY SYSTEMS, INC. [US/US]; Suite 110, 11201 S.E. 8th Street, Bellevue, WA 98004 (US). <b>(72) Inventor:</b> DENNIS, Charles, L.; 20804 N.E. 141st Street, Woodinville, WA 98072 (US). <b>(74) Agents:</b> TANNENBAUM, David, H. et al.; Fulbright & Jaworski, L.L.P., Suite 2800, 2200 Ross Avenue, Dallas, TX 75201 (US).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

**(54) Title:** SYSTEM AND METHOD FOR CONTROLLING FINANCIAL TRANSACTIONS OVER A WIRELESS NETWORK

**(57) Abstract**

A system and method for controlling financial transactions is disclosed. A customer, using a wireless device, identifies a point of sale and the amount of a transaction at that point of sale is first communicated to a central service and then transmitted to the wireless device for display at the wireless device. The customer can either accept the transaction amount to complete the transaction or reject the amount to cancel the transaction. The customer may have to enter a password or personal identification number to verify the authorization to use the wireless financial system. The customer is billed for the transaction via credit, debit, ATM or other methods, such as the wireless carrier or an internet provider.

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**SYSTEM AND METHOD FOR CONTROLLING FINANCIAL TRANSACTIONS  
OVER A WIRELESS NETWORK**

**RELATED APPLICATIONS**

This application is related to application Serial No. (P004US), SYSTEM AND METHOD FOR CONTROLLING PERSONAL INFORMATION AND INFORMATION DELIVERY TO AND FROM A TELECOMMUNICATIONS  
5 DEVICE, filed concurrently with this application and incorporated by reference herein. These applications are commonly assigned.

**TECHNICAL FIELD OF THE INVENTION**

This invention relates to wireless telephone networks, and more particularly to a system and method for coordinating financial transactions via a wireless telephone network.

### BACKGROUND OF THE INVENTION

Many point of sale locations, such as grocery stores and gas stations, have systems which allow customers to complete their purchases using a credit card or debit card. These systems typically have an electronic card reader or swipe device which  
5 reads data, such as account information, from the customer's card. After reading data from the card, the system presents a series of menus which prompt the customer for additional information, such as a password or personal identification number (PIN). The transaction is completed and the sale is finalized after the system verifies the customer's authority to use the card and after the customer verifies the transaction amount.

10 In a grocery store setting, the point of sale credit (debit) card device is usually in communication with the check-out registers. This system allows customers to pay for groceries without using cash or checks. Instead, the system bills the transaction to the credit card or transfers funds from customers' bank accounts to the merchant's bank account. If a debit card is used, then customers often have the option of obtaining cash  
15 from the clerk in addition to paying for their purchases.

Some point of sale locations, such as gas station pumps, allow customers to complete credit card or debit card transactions on their own, without the need for a clerk. Typically, customers have the option of either paying the gas station clerk or using a credit or debit card to pay at the pump. The customer is able to activate the  
20 pump simply by swiping the card in a card reader.

Most systems accept various combinations of credit and debit cards. Typically, a grocery store will accept credit cards, debit cards and bank automated teller machine (ATM) cards. Gas station pumps usually accept credit cards, debit cards and sometimes accept ATM cards. Gas stations typically accept universal credit cards, such as VISA,  
25 in addition to accepting proprietary or private label credit cards that are issued by the gasoline vendor. Systems that accept ATM cards often accept cards only from certain banking networks. Thus, if the customer's card is not issued by a particular banking network, then the point of sale system will not be able to process the transaction.

One problem with current point of sale systems is the limitation on the types of cards that can be used at various locations. Few, if any, point of sale locations have the capability of accepting and processing all types of credit cards and debit cards from every banking network. As a result, customers may not be able to use the point of sale systems at every business. Also, if customers are required to have multiple credit and debit cards to use the point of sale systems, then they will also have the burden of multiple passwords, PINs and bills.

Additionally, current systems limit customers to credit and debit cards. Consumers are not able to designate other accounts or methods of payment in addition to their credit or debit card accounts.

Accordingly there is a need in the art for a consumer to have a single mode for making all point of sale transactions.

Another need in the art is a system which allows consumers to designate any financial system as the source of funds to pay for various point of sale transactions.

A further need in the art is a system which, in real-time, positively identifies the purchaser as being the proper person authorized to use the account to which the merchandise is being charged or from which the funds are being withdrawn.

### SUMMARY OF THE INVENTION

These and other problems and needs are addressed by a system and method in which a customer can complete financial transactions at point of sale locations by using a wireless device, such as a wireless telephone or a pager. Once the customer indicates a particular point of sale location, such as a particular cash register and transmits that location over the wireless network, a financial system, using the wireless network, correlates the customer with a transaction amount entered by the merchant at the identified point of sale location. The point of sale location can be identified by selecting from a series of menus presented on the wireless display or by entering a unique location identifier on the wireless device. It will be understood that, while a wireless telephone is used to describe one embodiment of the present invention, the wireless device does not have to have voice capability and that any other two-way wireless device may be used.

When the transaction is to be finalized, the total purchase price or transaction amount is displayed on the customer's wireless telephone along with a prompt to accept or reject the transaction. If the transaction is accepted, then customers are further prompted to enter a password or PIN to ensure that they are authorized to make the transaction. This entry of a password or PIN ensures that the person using the wireless device is authorized to do so.

Upon acceptance of the wireless financial transaction, the financial system then charges the transaction amount to a bank account, credit card or other billing means that has been designated by the customer. Also, the transaction amount is credited to an account designated by the merchant.

It is a feature of the present invention to provide a system and method for using a wireless device to complete financial transactions at various point of sale locations.

It is another feature of the present invention to provide a system and method wherein a customer can designate how a wireless financial transaction should be billed. The customer can optionally use funds from a designated bank account, charge the transaction to a credit card or have the transaction billed as part of a wireless or internet

service provider's monthly statement. The customer can dynamically change the billing method on a monthly basis or on a transaction-by-transaction basis.

It is an additional feature of the present invention to allow the customer to specify different payment sources for different types of wireless financial transactions.

5           The foregoing has outlined rather broadly the features and technical advantages of the present invention in order that the detailed description of the invention that follows may be better understood. Additional features and advantages of the invention will be described hereinafter which form the subject of the claims of the invention. It should be appreciated by those skilled in the art that the conception and the specific  
10           embodiment disclosed may be readily utilized as a basis for modifying or designing other structures for carrying out the same purposes of the present invention. It should also be realized by those skilled in the art that such equivalent constructions do not depart from the spirit and scope of the invention as set forth in the appended claims.

### BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention, and the advantages thereof, reference is now made to the following descriptions taken in conjunction with the accompanying drawings, in which:

5           FIGURE 1 is a block diagram of a system employing the present invention;

          FIGURE 2 is a block diagram illustrating the communication links in a system employing the present invention;

          FIGURE 3 is a block diagram illustrating the interaction of various financial entities with the present invention; and

10          FIGURE 4 is a series of menus that are presented on a wireless telephone display.



### DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGURE 1 shows system 10 having point of sale terminal 11 at location 100. Point of sale terminal 11 has register 12 for indicating the amount of a customer's purchases. Point of sale terminal 11 is linked to financial gateway 18 via communication link 101. Communication link 101 can be embodied using any means for transmitting information from one location to another, such as a data bus, local area network (LAN), the internet, a dedicated telephone line, a wireless connection or via the customers own wireless device (not shown).

Location 100 can be any point of sale location, such as a grocery store, gas station, vending machine or even an ATM. Depending upon the type of location 100, point of sale terminal 11 will be constructed as appropriate. For example, terminal 11 may be coupled to a cash register, gas pump or vending machine in the same manner in which swipe devices are currently connected to those machines. Depending upon the particular business, point of sale terminal 11 may use register 12 to reflect a final transaction cost or terminal 11 may be used to authorize a device to dispense a product, such as gasoline from a pump or soda from a machine. When, for example, a customer makes a grocery purchase, system 10 will usually know the total transaction cost when the customer accesses the wireless financial system. On the other hand, if the customer is buying gasoline or using a vending machine, the wireless financial system may be used first to authorize the pump (or vending machine) to dispense gas (or soda) and then to confirm the total transaction amount after the customer stops pumping gas (or has received the desired merchandise). In this manner, a person entering a store could use his/her wireless device to indicate his/her presence in the store to the financial transaction system. The user could then authorize purchases of items as they are taken off the shelf or have each item credited to his/her account. For example, a person could use a bar code reader attached to the wireless device, or attached to a shopping cart, to identify specific items and to authorize the purchase of the selected merchandise. When the user leaves the store, his/her account would be charged for the items and the

merchant would be paid. This arrangement could eliminate checkout lines in some situations.

Also shown at location 100 is mobile wireless telephone 13 having keypad 14, display 15 and antenna 16. Wireless telephone 13 communicates with wireless network 17 via antenna 16 communicating with cell site antenna 19. In a preferred embodiment, wireless telephone 13 complies with the IS-136 protocol or other wireless communication standards, such as time-division multiple access (TDMA), code division multiple access (CDMA) or frequency division multiplexing (FDM). As discussed above, telephone 13 could be any type of wireless communications device, such as a two-way pager.

Wireless network 17 is connected to financial gateway 18 via communication link 102. Like communication link 101, communication link 102 can be a data bus, local area network (LAN), dedicated telephone line, the internet, a wireless connection or any other means of transmitting data from one location or device to another.

System 10 operates to allow a customer (not shown) to use wireless telephone 13 to purchase goods or services at location 100. After the customer decides on a purchase, the transaction cost is displayed at location 100 on register 12 or alternatively is displayed on display 15 of a wireless device. In other situations, the transaction cost can simply be transmitted to network 17 or financial gateway 18 without display. To complete the transaction and accept the purchase price, the customer uses wireless telephone 13 to access the appropriate financial application within wireless network 17. In a preferred embodiment, the customer dials a specific number that corresponds to wireless financial transactions. The financial application uses information from financial gateway 18 to link a specific wireless telephone 13 to a specific register 12. If the purchase data is being entered at telephone 13, then the financial information is delivered to financial gateway 18 via network 17.

Wireless network 17 can identify wireless telephone 13 by using the mobile number identification (MNI) function. A specific customer can be identified by prompting the customer for a password or PIN. Once the customer and/or wireless

telephone 13 are identified, system 10 can verify whether the customer is authorized to make wireless financial transactions, for example, by checking an account balance, verifying the validity of a credit card or some other criteria. Then system 10 proceeds in certain operating environments to identify the specific location 100, terminal 11 and register 12 that is involved in the transaction.

Wireless network 17 is comprised of a number of individual wireless cells. Each cell serves a limited geographic area through antenna 19. System 10 can identify the customer's geographic area by determining which antenna 19 is being used during the customers call on wireless telephone 13. Once the geographic area is identified, system 10 can determine the point of sale locations 100 that are within the identified area. The size of the geographic area will vary depending upon wireless network 17. In most networks, antenna 19 will serve several square miles. In this situation, it is likely that many businesses will be within the area covered by antenna 19. However, future networks may have the capability to use pico cells that will serve a very small area. Pico cells will allow network 17 to place the customer in a very small geographic area and potentially link the customer to a particular point of sale location without additionally input from the user. Thus, a user may simply walk into a store, or walk up to a register, and enter a code in his/her wireless device. The system would then link that user to the register so that the specific transaction data can be entered.

Display 15 on wireless telephone 13 presents the customer with a menu or list of potential sales locations 100. Of course, this menu could be an audible message that is broadcast to the listening user on device 13. The list of businesses can be derived using the geographic area of active antenna 19. For example, the customer could choose a display 15 so that only those point of sale locations within the area served by antenna 19 are displayed. In other cases, display 15 could show all point of sale locations. The customer, using telephone 13, selects the appropriate location 100 from the menu on display 15. Depending upon the size of display 15 and the number of businesses displayed, the customer may have to scroll through one or more menu screens to find a particular point of sale location 100. After selecting the proper location, the customer is

then prompted to identify a specific point of sale terminal 11. Again, as discussed above, some or all of these steps can be eliminated as wireless system capabilities are expanded.

5 In one embodiment, once a particular terminal 11 is identified, the transaction amount on register 12 is transmitted from terminal 11 to financial gateway 18 over connection 101. Financial gateway 18 receives information from all registers 12 on all terminals 11 at all point of sale locations 100. One of the functions of system 10 is match the proper transaction amount from register 12 with the correct customer using wireless telephone 13.

10 After the customer has identified a particular location 100, financial gateway 18 transfers the register 12 value (received as discussed above) to wireless network 17 over link 102. Wireless network 17 has information from the customer regarding the relationship between telephone 13 and particular point of sale register 12. Wireless network 17 then matches the customer with point of sale register 12 using information  
15 from financial gateway 18. The amount shown in register 12 is then transmitted to telephone 13 from network 17 via wireless antennas 19 and 16, for display on screen 15 to the user.

The financial information which was passed from point of sale 11 through financial gateway 18 to wireless network 17 could also be passed using different routes.  
20 For example, point of sale terminal 11 could be capable of wireless transmission (not shown) which would allow register 12 information to be transmitted directly to wireless network 17. The transaction amount in register 12 could then be passed via link 102 from wireless network 17 to financial gateway 18 for processing. The information could be passed to gateway 18 via the customer's telephone 13. By using well-known speech  
25 recognition (not shown) the transaction amount could be spoken into terminal 13 and decoded at switching center 17 or at gateway 18.

After wireless network 17 sends the transaction amount to wireless telephone 13, the customer can "accept" the displayed amount to complete the sale or "reject" the amount to refuse the transaction. The accept option could be coupled with a password

or PIN to verify that an authorized user is making the purchase. The password could vary for different users of telephone 13 or it could be the same for all users of telephone 13, or it could vary by transaction amount or by purchase type.

When the customer accepts the amount displayed, financial gateway 18  
5 acknowledges to terminal 11 that the transaction has been successfully completed. If the customer rejects the transaction, enters the wrong password or does not have sufficient funds, then financial gateway 18 can inform terminal 11 that the transaction has been canceled. In situations when point of sale 100 is not used, then certain codes could be sent to device 13 which in turn would authorize the user to leave the premises with  
10 his/her purchases.

For completed transactions, financial gateway 18 arranges for payment to the proprietor of point of sale terminal 11, and arranges for the billing method specified by the customer who owns telephone 13 or who was identified by a password or PIN during the transaction. These payments and billings can be accomplished by any of a  
15 number of well known methods. For example, financial gateway could obtain funds from any source designated by the customer, such as a credit card, debit card, bank account or the transaction could appear on the customer's wireless service bill. Once the customer's funds have been identified and obtained, then financial gateway 18 would transfer the funds to an account or other depository designated by the point of sale  
20 proprietor. All these transactions are not shown but are implicit in financial gateway 18.

System 20 in FIGURE 2 is a typical internet service provider's network 23 connected to a subscriber's personal computer (PC) 21 through connection 201. The subscriber can manage, via internet 23, a personal profile of information for wireless financial transaction system 10. The personal profile would allow a customer to use  
25 display 22 to set up and modify his/her predetermined preferences for wireless financial transactions. For example, the customer could specify methods of payment, such as which credit card or bank account is to be used by financial gateway 18 during a wireless financial transaction. The customer could also choose to have wireless transactions billed as part of the wireless service provider's monthly statement. If

customers have established or preferred business relationships, they could also identify preferred vendors or point of sale locations 100. This operation could be conducted directly from device 13, either by menu selection or by voice commands.

Financial gateway 18 and wireless network 17 are linked to the customer via internet connections 202 and 203. This allows customers to modify their personal profile on PC 21 and then update their records on financial gateway 18 and wireless network 17 via internet 23. Using the personal profile information, wireless network 17 can select the proper information to provide to the customer during a wireless financial transaction. One use of the personal profile would be to select the list of potential locations 100 that are displayed when the customer initiates a transaction. For example, if the customer has indicated that he/she prefers to shop at a particular chain of grocery stores or gas stations, then wireless network 17 can select the potential point of sale locations based upon the customer's preferences. This would allow the customer to identify a particular point of sale terminal 11 faster thereby increasing the efficiency of system 10.

The customer's personal profile could also be adjusted based upon the frequency of use for certain locations. Typically, shoppers use a certain few businesses the majority of the time. For example, they may shop at the same grocery store or they may use the same neighborhood gas station every week. Financial gateway 18 or wireless network 17 could monitor the statistical use of certain businesses and update customers' personal profiles accordingly. Using this information, the menu of point of sale locations 100 could list the businesses that the customer uses most often before listing other businesses in that geographic area.

Financial gateway 18 can continually track the personal profile information that is provided by the customer at PC 21 using link 202 to internet 23. Financial gateway 18 can also manage customers' transactions on a transaction-by-transaction basis using the personal profile. A memory device or a server (not shown) located at financial gateway 18 could be used to track customer information. Also, financial gateway 18

could use internet 23 to gather information from customers' computer 21 in real-time during a transaction.

For each transaction, financial gateway 18 receives information both from point of sale location 100, such as the transaction amount and the vendor's identity, and from wireless telephone 13, such as the customer's identity. The customer's identity is matched to a specific personal preference record to determine how the transaction will be billed. Once wireless network 17 indicates that the transaction has been completed properly, the merchant will be paid by one of the various methods described by FIGURE 3.

In FIGURE 3, system 30 shows financial gateway 18 connected to various entities that may be used for transferring funds during a wireless financial transaction. Financial gateway 18 is connected via link 301 to banking network 31 which allows financial gateway to verify account balances and to transfer funds among customer and business bank accounts. Credit card clearing house 32 allows financial gateway 18 to bill wireless transactions to customers' credit cards. Wireless provider's billing system 33 and internet provider's billing system 34 allow financial gateway 18 to bill transactions to the customer's wireless provider or internet provider. These transactions could then be billed to the customer as part of the providers' monthly statement. Block 35 represents any other financial management institutions which may be used to transfer funds as part of a wireless financial transaction. Communications link 301 can be any means of transferring financial information from one location to another.

Customers can set their personal profile to identify the source of payment for various transactions. For example, transactions at a grocery store could be billed to a universal credit card, such as VISA, transactions at a particular gas station could be billed to that company's proprietary or private label credit card and transactions at vending machines could be billed to a bank account for direct reduction.

In another embodiment, the customer can set up a primary payment source for all transactions and a secondary payment source to be used if the primary source is overdrawn or above a credit limit. For example, the customer could designate his bank

account as the primary payment source, but if the account balance is below a specified level, then additional wireless transactions could be billed to a credit card.

FIGURE 4 shows a typical series of menus for use in the present invention. In the example shown, a customer desires to purchase gas from a particular pump. The customer first dials a number to access the wireless financial service application in wireless network 17. The application receives the call and identifies the calling wireless telephone using MNI. Alternatively, the application could request an identification number from the customer. The application then causes an initial message 400 to be displayed on wireless telephone 13. Message 400 may repeat the number of calling telephone 13, as shown, or the customer's name so that the caller knows that he/she has been identified properly. In other cases, the display may prompt the customer for a password or PIN for identification or to verify the caller's authority to use the financial transaction application.

In addition to identifying the caller, the wireless financial transaction system determines the caller's geographic location by identifying cell site antenna 19 which is communicating with wireless telephone 13. Display 15 then shows menu 401 to the customer. In a preferred embodiment, menu 401 lists several categories of the point of sale locations 100 that fall within the geographic area of the customer's cell site. In other embodiments, the customer's personal profile may cause the display to show all the point of sale locations in all categories or in certain categories without regard to whether they fall within a particular geographic area. These menus, in the preferred embodiment, reside either at switching center 17 or at gateway 18 and are transmitted to device 13.

In the present example, the customer is at a gas station and desires to complete a transaction at a particular pump, so the "Gas Stations" category is selected on menu 401. This causes menu 402 to be displayed. The customer then selects a particular chain of gas stations to get menu 403 which shows the street addresses for that vendor's gas stations. The information in menu 403 may list a specific street address or it may list an intersection where a particular gas station is located. It will be understood that



specific locations 100 can be identified in any number of ways in addition to the vendor's address.

After identifying a particular gas station, the customer then selects the correct gas pump from menu 404. Concurrently, the gas station provides information to financial gateway 18 regarding the transaction amounts for the gas provided at each pump. This corresponds to register 12 in FIGURE 1. Once the customer has identified a specific pump, financial gateway transmits the transaction cost to wireless telephone 13. In menu 405, this amount is displayed for the customer and he/she is prompted to accept or reject the transaction by selecting a particular button on keypad 14. If the transaction amount is correct and the customer accepts the transaction, he/she may be further prompted to enter a PIN or password in menu 406 to verify that he/she is authorized to make the transaction. Upon entering the correct PIN, the transaction is completed and financial gateway 18 charges the transaction cost to the account, credit card or other entity specified by the customer's personal profile.

The menus described above can be modified to present almost any sequence of information to the customer. In one embodiment, the customer could select "Point of Sale ID" from menu 401. This would present menu 407 which prompts the customer for the identifier of a specific point of sale terminal 11. For example, a unique number assigned to gas pump #3 at the gas station selected above, such as 9999. After the customer enters the terminal's identifier, the menu display could jump immediately to menu 405 where the customer is shown the transaction amount for that specific point of sale terminal 11 and asked to accept or reject the transaction. This would reduce the number of menus and increase the efficiency of system 10.

It will be understood that the above described menu arrangement can also be used to locate businesses that are members of the present wireless financial system. For example, if a potential customer needed gas and desired to make a wireless financial transaction to purchase the gas, then by following the sequence in FIGURE 4 to display menu 403, the customer would receive a list of nearby gas stations that accept wireless financial transactions. In other embodiments, menu 403 could be modified to show all

gas stations (or other business categories) in a certain geographic area. If there are no business of a certain category within the potential customer's geographic area, then menu 403 could display the closest business of that type.

Although the above examples often use grocery stores and gas stations, it will be understood that the present invention can be used with any retail store or other point of sale location. Furthermore, the present wireless financial transaction system could be used to pay any bill, such as a mortgage payment, utility bill, tax bill, tuition or other loan. The vendor, institution or other entity that sends the bill could participate in a wireless financial system by using a unique identifier for each bill or required payment. The bill or payment that is due could be selected by the customer in the same manner that a point of sale location is selected and the customer could use the personal profile to designate the source of funds to satisfy the bill or payment obligation that is due.

The system could be used to keep the user's checkbook, thereby allowing the user, while at home or while roaming, to pay bills and maintain his/her financial accounts. In this respect, a linkage to a brokerage house could display the user's investments and allow for selling or buying such investments.

In addition, the system could be used by a customer for comparison shopping simply by entering an item identifier and the amount and the system could respond with other known prices. The system could even display product specifications from a database.

Although the present invention and its advantages have been described in detail, it should be understood that various changes, substitutions and alterations can be made herein without departing from the spirit and scope of the invention as defined by the appended claims.

WHAT IS CLAIMED IS:

1. A system for controlling financial transactions using a wireless network, wherein customers having wireless devices desire to complete particular transactions, said system comprising:

means for receiving transaction amounts from a wireless network; and

5 means for displaying received transaction amounts on said customers' wireless devices.

2. The system of claim 1 further comprising:

means for said customers to verify said displayed transaction amounts.

3. The system of claim 1 wherein said transaction amounts correspond to point of sale transactions.

4. The system of claim 1 wherein said transaction amounts are amounts to be posted on billing statements.

5. The system of claim 3 further comprising:

means for charging said transaction amounts to a source of funds selected by said customers.

6. The system of claim 5 wherein said source of funds is a bank account.

7. The system of claim 5 wherein said source of funds is a credit card account.

8. The system of claim 5 wherein said source of funds is an account with a wireless service provider.

9. The system of claim 5 wherein said source of funds is an account with an internet service provider.

10. The system of claim 5 further comprising:  
means for allowing each said customer to identify said source of funds before said transaction occurs.

11. The system of claim 10 wherein different sources of funds can be identified for different types of transactions.

12. The system of claim 2 further comprising:  
a point of sale terminal;  
means for communicating a particular transaction amount from said point of sale terminal to a database; and

5 means for associating said particular transaction in said database with a particular customer so that the transaction amount displayed to said customer is a transaction occurring in real-time with respect to said customer.

13. The system of claim 12 wherein said associating means comprises:  
means for transmitting an identity code from said customers wireless device to a wireless network; and

5 means, controlled at least in part by said wireless network, for correlating said transmitted identity code with a particular transaction occurring at a particular point of sale terminal.

14. A method for controlling financial transactions using a wireless network, wherein customers having wireless devices desire to complete particular transactions, said method comprising the steps of:

5 receiving transaction amounts from a wireless network; and  
displaying said received transaction amounts on said customers' wireless devices.

15. The method of claim 14 further comprising the step of:  
verifying said displayed transaction amount.
16. The method of claim 15 wherein said customers verify said displayed  
transaction amounts by accepting a transaction.
17. The method of claim 15 further comprising the step of:  
charging said transaction amounts to a source of funds selected by said  
customers.
18. The method of claim 17 wherein said source of funds is a bank account.
19. The method of claim 17 wherein said source of funds is a credit card  
account.
20. The method of claim 17 wherein said source of funds is an account with  
a wireless service provider.
21. The method of claim 17 wherein said source of funds is an account with  
an internet service provider.
22. The method of claim 17 further comprising the step of:  
preselecting said source of funds before said transaction occurs.
23. The method of claim 17 further comprising the step of:  
identifying different sources of funds for different types of transactions.
24. The method of claim 15 further comprising the steps of:

communicating a particular transaction amount from a point of sale terminal to a database; and

5 associating said particular transaction in said database with a particular customer so that the displayed transaction amount corresponds to a transaction occurring in real-time with respect to the customer.

25. The method of claim 24 further comprising the steps of:

transmitting an identity code from said customer's wireless device to a wireless network; and

5 correlating said transmitted identity with a particular transaction occurring at a particular point of sale.

26. A system for controlling financial transactions over a wireless network comprising:

terminals at point of sale locations, wherein said terminals contain transaction information;

5 a financial gateway coupled to said terminals, wherein said financial gateway receives said transaction information; and

a wireless network coupled to said financial gateway, wherein said wireless network is operable to transmit said transaction information for display on wireless devices; and

10 means for directing particular transaction information to a particular wireless device.

27. The system of claim 26 further comprising:

means for allowing said particular customer to complete said financial transactions by verifying said displayed transaction information.

28. The system of claim 27 wherein said financial gateway is coupled to said terminals through said wireless network and wherein said transaction information is provided to said financial gateway through said wireless network.

29. The system of claim 27 wherein said financial gateway is coupled to said terminals through a data network.

30. The system of claim 27 wherein said financial gateway is coupled to said terminals through the internet.

31. The system of claim 27 wherein said transaction information comprises a transaction cost.

32. The system of claim 27 wherein said transaction information comprises an identity of said point of sale location.

33. The system of claim 32 wherein said wireless devices display said location identity and a transaction cost.

34. The system of claim 33 further comprising:  
means for prompting said customers to verify said displayed transaction cost.

35. The system of claim 33 further comprising:  
means for prompting said customers to accept said displayed transaction cost in order to complete said transaction.

36. The system of claim 33 further comprising:  
means for accepting code information from said particular customer.

37. A method for controlling transactions using a wireless network comprising the steps of:

- 5 determining transaction amounts at point of sale locations;  
transmitting said transaction amounts over said wireless network to wireless devices;  
displaying said transaction amounts for customers using said wireless devices;  
completing said transactions by charging said transaction amounts to sources of funds identified by said customers.

38. The method of claim 37 further comprising the step of:  
identifying said point of sale locations.

39. The method of claim 37 wherein said wireless devices are wireless telephones.

40. The method of claim 38 wherein said customers select said point of sale locations using a series of menus displayed on said wireless devices.

41. The method of claim 37 further comprising the step of:  
identifying said customers.

42. The method of claim 41 wherein said customers are identified using a mobile number identification function of said wireless network.

43. The method of claim 38 wherein said customers are identified using identification codes entered by said customers.

44. The method of claim 41 further comprising the step of:  
correlating said identified customers with specific point of sale locations.



45. The method of claim 44 wherein said customers identify said specific point of sale locations.

46. The method of claim 45 wherein said wireless devices are wireless telephones.

47. The method of claim 37 wherein said sources of funds are preselected by said customers before said transactions occur.

48. The method of claim 37 wherein said sources of funds are selected by said customers during said transactions.

49. A system for processing financial data, wherein said financial data relates to transactions by customers at point of sale locations and wherein said customers have wireless devices that are in communication with a wireless network, said system comprising:

5 means for receiving financial data from a plurality of point of sale locations;  
means for communicating said financial data over said wireless network for receipt by said customers' wireless devices;  
means for informing said customers of said communicated financial data; and  
means for determining whether a particular customer has verified said financial  
10 data received by said customer's wireless device.

50. The system of claim 49 wherein said informing means comprises a visual display on said wireless device.

51. The system of claim 49 wherein said informing means comprises a voice message.

52. The system of claim 49 further comprising:

means for entering verified financial data in a billing database.

53. The system of claim 49 further comprising:  
means, controlled by said customers, for selecting a billing method.

54. The system of claim 49 wherein said receiving means is linked to said point of sale locations by a data network.

55. The system of claim 49 wherein said receiving means is linked to said point of sale locations by a dedicated telecommunications connection.

56. The system of claim 49 wherein said receiving means receives said financial data from said point of sale locations via said wireless network.

57. The system of claim 49 further comprising:  
means for identifying said point of sale locations.

58. The system of claim 57 wherein said identifying means receives inputs from said customers to identify said point of sale locations.

59. The system of claim 58 wherein said customers identify said point of sale locations using menus displayed on said wireless telephones.

60. The system of claim 59 further comprising:  
means for determining a geographic area of said customer.

61. The system of claim 60 wherein said geographic area is determined in part by identifying a specific cell site which is communicating with said customers' wireless telephones, wherein said cell site is part of said wireless network.

62. The system of claim 60 wherein said geographic area is determined in part by identifying a wireless network antenna which is communicating with said customers' wireless telephones.

63. The system of claim 49 further comprising:  
means for identifying said customers.

64. The system of claim 63 wherein said financial data comprises transaction costs for one or more of said transactions at said point of sale locations.

65. The system of claim 64 wherein said transaction costs are charged to sources of funds selected by said customers.

66. A method for controlling a transaction at a point of sale location comprising the steps of:  
identifying a customer using a wireless device;  
identifying a transaction amount for said transaction; and  
correlating said identified customer and said identified transaction amount.

67. The method of claim 66 wherein said transaction is completed using a point of sale terminal at said point of sale location.

68. The method of claim 67 wherein said transaction amount identifying step comprises the steps of:  
calculating a transaction amount at said point of sale terminal; and  
transmitting said transaction amount to a wireless network.

69. The method of claim 66 wherein said wireless device is a wireless telephone and wherein said customer identifying step comprises the steps of:  
identifying said wireless telephone; and

correlating said identified wireless telephone to said customer.

70. The method of claim 66 further comprising the step of:  
prompting said customer to enter an identification code on said wireless device.

71. The method of claim 66 wherein said transaction amount identifying step  
further comprises:  
identifying said point of sale location.

72. The method of claim 71 wherein said point of sale location is identified  
by said customer using menus displayed on said wireless device.

73. The method of claim 71 wherein an amount corresponding to said  
identified point of sale location is displayed to said customer.

74. The method of claim 73 wherein said customer identifies said displayed  
point of sale amount as said transaction amount.

75. The method of claim 66 further comprising the steps of:  
selecting at least one source of funds for said customer; and  
charging said transaction amount to said at least one source of funds.

76. The method of claim 75 further comprising the step of:  
crediting said transaction amount to an account selected by a merchant at said  
point of sale location.

77. The method of claim 75 wherein said source of funds selecting step  
further comprises the step of:  
selecting different sources of funds for different types of transactions.

78. The method of claim 75 wherein said source of funds selecting step is completed contemporaneously with said transaction.

79. The method of claim 75 further comprising the step of:  
creating a customer profile, wherein said at least one source of funds is selected during said profile creating step.

80. The method of claim 75 wherein said at least one source of funds is a credit card account.

81. The method of claim 75 wherein said at least one source of funds is a bank account.

82. The method of claim 75 wherein said at least one source of funds is a debit account.

83. The method of claim 75 wherein said at least one source of funds is a wireless network service provider account.

84. The method of claim 75 wherein said at least one source of funds is an internet service provider account.

85. The method of claim 66 wherein said correlating step comprises the steps of:

receiving, on a wireless network, a point of sale identifier from said identified customer; and

receiving, on a wireless network, a plurality of transaction amounts each having a unique point of sale identifier.

86. A system for controlling a transaction at a point of sale location comprising:

means for identifying a customer using a wireless device;

means for identifying a transaction amount for said transaction; and

5 means for correlating said identified customer and said identified transaction amount.

87. The system of claim 86 further comprising:  
a point of sale terminal at said point of sale location.

88. The system of claim 87 wherein said point of sale terminal is coupled to a wireless network.

89. The system of claim 86 wherein said wireless device is a wireless telephone.

90. The system of claim 86 further comprising:  
an identification code for said customer.

91. The system of claim 86 further comprising:  
means for identifying said point of sale location.

92. The system of claim 91 further comprising:  
one or more point of sale location menus displayed on said wireless device.

93. The system of claim 91 further comprising:  
means for said customer to verify a displayed point of sale amount.

94. The system of claim 86 further comprising:  
means for selecting at least one source of funds for said customer; and

means for charging said transaction amount to said at least one source of funds.

95. The system of claim 94 further comprising:

means for crediting said transaction amount to an account selected by a merchant at said point of sale location.

96. The system of claim 94 wherein said source of funds selecting means further comprises:

means for selecting different sources of funds for different types of transactions.

97. The system of claim 94 wherein said means for selecting at least one source of funds for said customer comprises:

means for creating a customer profile, wherein said customer profile identifies said at least one source of funds.

98. A system for processing financial data for transactions in which customers use wireless devices to identify point of sale locations and to confirm transaction amounts, said system comprising:

means for receiving said financial data from said point of sale locations;

5 means for customer information from a wireless network; and

means for correlating said financial data with said customer information.

99. The system of claim 98 further comprising:

means for charging transaction amounts for said transactions to sources of funds.

100. The system of claim 99 further comprising:

means for said customers to select individual profiles to identify said sources of funds.

101. The system of claim 98 wherein said correlating means further comprises:

a database.

102. The system of claim 101 wherein said database comprises:  
data which links individual wireless devices to individual customers.

103. The system of claim 101 wherein said database comprises:  
data which links point of sale identifiers to point of sale transaction amounts.

104. The system of claim 101 wherein said database comprises:  
data which links individual customers to one or more sources of funds.

105. A point of sale terminal device for a financial system in which customers  
use wireless devices to identify said point of sale terminals and to verify transaction  
amounts related to said point of sale terminals, said terminal comprising:

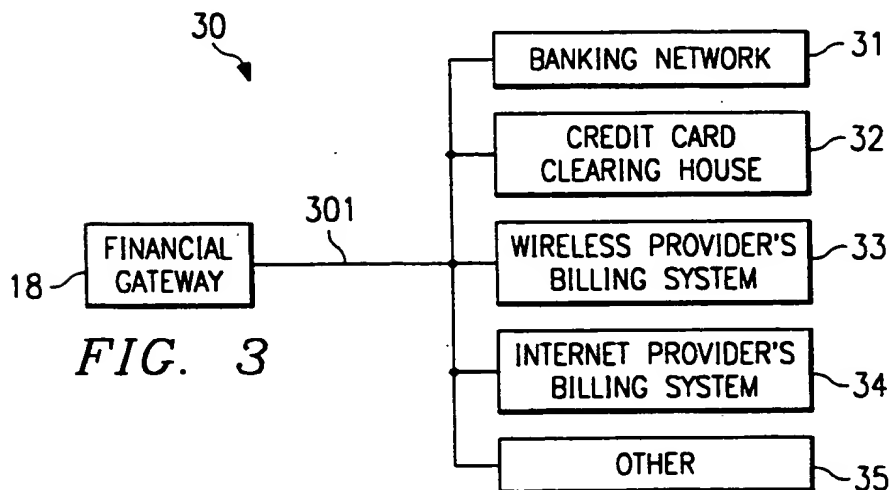
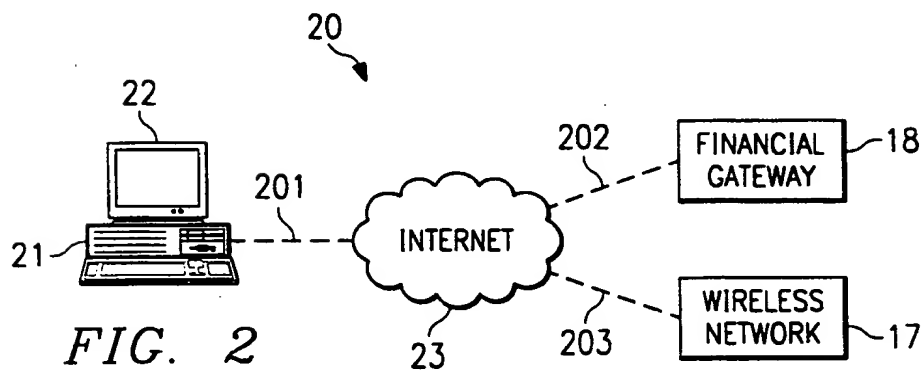
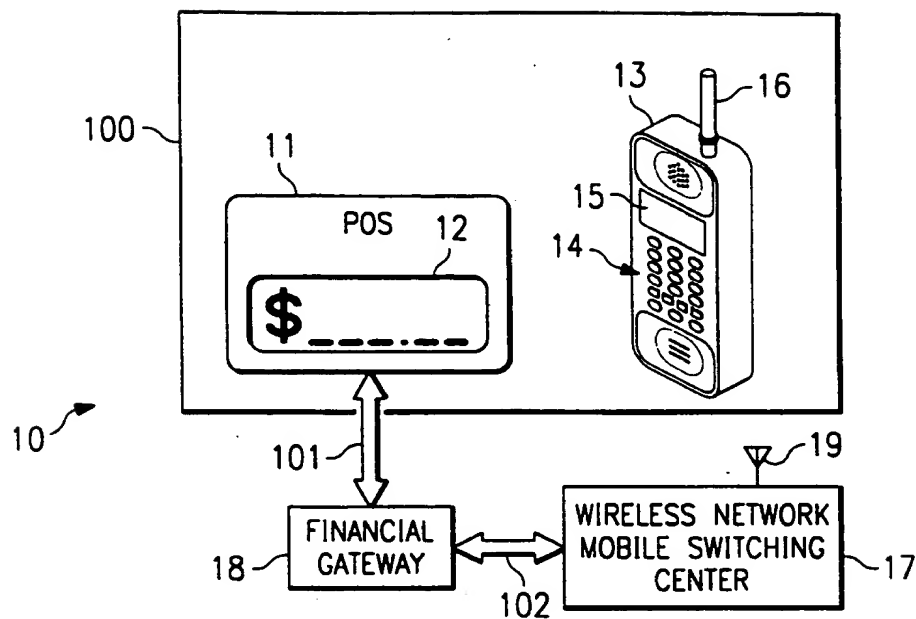
means for determining said transaction amounts at said point of sale;

5 means for transmitting said transaction amounts to a financial network for  
verification by said customers; and

means for receiving notification that said transaction amounts have been verified  
by said customers using said wireless devices.

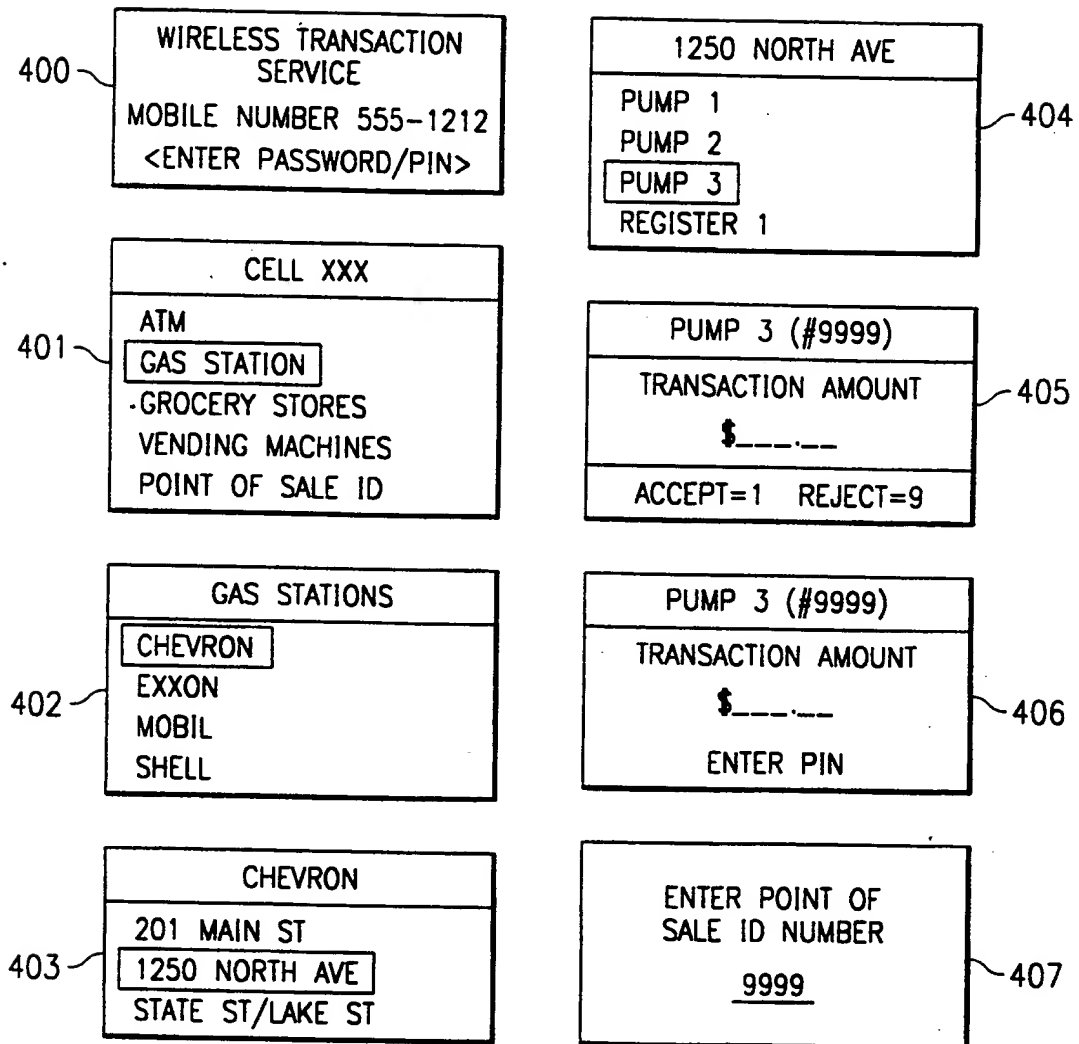


1/2  
FIG. 1



2/2

FIG. 4



# INTERNATIONAL SEARCH REPORT

Inte. onal Application No

PCT/US 98/26786

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 G07F19/00 H04M17/00

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 G07F H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97 45814 A (B. VAZVAN) 4 December 1997	1-9, 12-21, 24, 25, 37-46, 49, 50, 52-56, 66-74, 86-94, 98, 105
A	see the whole document  ---  -/--	26-36, 57-65, 80-85

☒ Further documents are listed in the continuation of box C.

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07/06/1999

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NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	see abstract; claims; figures 1-4	66-69, 86-89
	see column 1, line 32 - column 2, line 12	
	see column 2, line 55 - column 4, line 5	
	see column 5, line 33 - column 6, line 41	
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A	see abstract; claims; figures	26-36, 41-48, 52-58, 70-85, 90-97
A	WO 96 13814 A (B. VAZVAN) 9 May 1996	
P,A	EP 0 848 360 A (BRITISH TELECOMMUNICATIONS) 17 June 1998	

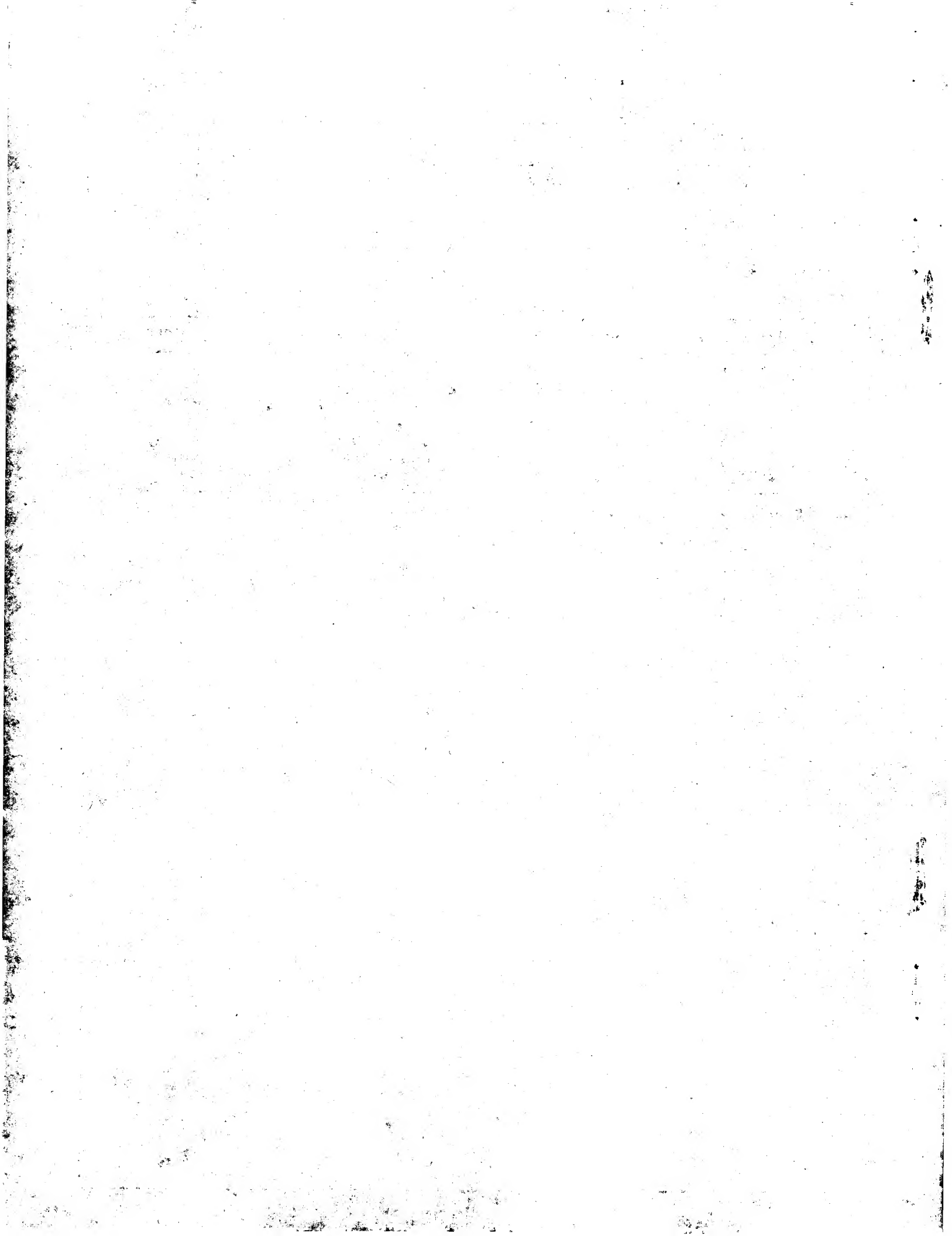
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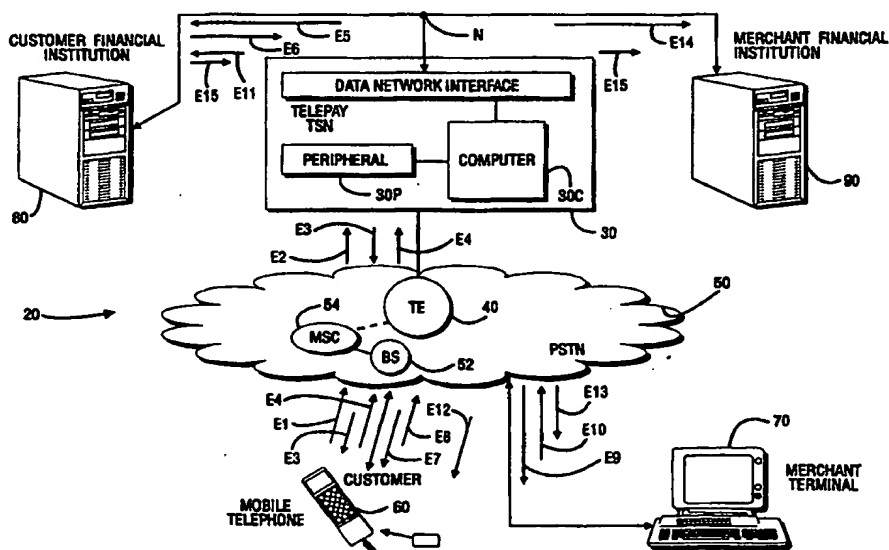




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : G07F 19/00, H04M 17/00, G06F 17/60	A1	(11) International Publication Number: WO 98/47116 (43) International Publication Date: 22 October 1998 (22.10.98)
(21) International Application Number: PCT/SE98/00691 (22) International Filing Date: 15 April 1998 (15.04.98) (30) Priority Data: 60/043,610 15 April 1997 (15.04.97) US 60/049,774 16 June 1997 (16.06.97) US 09/047,533 25 March 1998 (25.03.98) US (71) Applicant: TELEFONAKTIEBOLAGET LM ERICSSON (publ) [SE/SE]; S-126 25 Stockholm (SE). (72) Inventor: HULTGREN, Anders; Rättarens väg 16, S-182 34 Danderyd (SE). (74) Agent: ERICSSON TELECOM AB; IPR Management & Patent Dept., S-126 25 Stockholm (SE).	(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.	

(54) Title: TELE/DATACOMMUNICATIONS PAYMENT METHOD AND APPARATUS



## (57) Abstract

A tele/datacommunications network has a service node (TSN) (30) which facilitates payment/transfer from a customer account of a customer financial institution (80) to a merchant account of a merchant financial institution (90). The TSN (30) acquires a merchant identifier and transaction amount from a customer mobile station (60). The TSN (30) sends a transaction verification request message to both the customer mobile station (60) and the merchant terminal (70). Upon receipt of transaction verification, the TSN (30) requests transfer of the transaction amount from the customer account to the merchant account.

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# **TELE/DATACOMMUNICATIONS PAYMENT METHOD AND APPARATUS**

## **BACKGROUND**

This application claims the benefit of the following, both of  
5 which are incorporated herein by reference: (1) United States Provisional  
Patent Application No. 60/043,610 which was filed on April 15, 1997 by  
the same inventor bearing title TELE/DATACOMMUNICATIONS  
PAYMENT METHOD AND APPARATUS; (2) United States  
Provisional Patent Application No. 60/049,774 which was filed on June 16,  
10 1997 by the same inventor bearing title  
TELE/DATACOMMUNICATIONS PAYMENT METHOD AND  
APPARATUS.

### **1. FIELD OF THE INVENTION**

This invention pertains to employment of telecommunications to  
15 facilitate financial transactions.

### **2. RELATED ART AND OTHER CONSIDERATIONS**

Many consumer-based commercial transactions involve  
payment using a credit card or bank debit card. In the course of such  
transactions, a computerized "cash register" terminal or the like is  
20 connected by a telecommunications link to a financial institution (e.g., a  
bank or credit card company which sponsors the card) for the purpose of  
obtaining an authorization or indication that the consumer's account  
balance is sufficient to cover the cost of the particular transaction. In the

case of a bank debit card, the consumer's account is essentially immediately debited for the amount of the transaction, and the funds ultimately made available to the seller or provider of services. For a credit card, on the other hand, the consumer is subsequently mailed a bill requiring payment for the transaction.

For consumers utilizing written checks, similar services are available for obtaining at least preliminary approval that the check will clear the bank upon which the check is drawn.

The check, credit card, and debit card modes of payment require, of course, that the consumer physically possess the same at the time of the transaction. Checks, credit cards, and debit cards are of no value if left at home or otherwise unavailable at the time of the transaction.

Moreover, there are significant security risks involved with utilization of checks, credit cards, and debit cards. All are prone to being lost or stolen, and subsequently improperly used by third persons. A further risk is that imprints or copies of the cards may enable unauthorized use by a third person.

What is needed, therefore, and an object of the present invention, is a secure and efficient mode of payment for a financial transaction.

## **BRIEF SUMMARY OF THE INVENTION**

A tele/datacommunications network has a service node (TSN) which facilitates payment/transfer from a customer account of a customer

financial institution to a merchant account of a merchant financial institution. The TSN acquires a merchant identifier and transaction amount from a customer mobile station. The TSN sends a transaction verification request message to both the customer mobile station and the merchant  
5 terminal. Upon receipt of transaction verification, the TSN requests transfer of the transaction amount from the customer account to the merchant account.

The TSN of the invention also optionally provides an  
10 authorization assurance feature and a security feature. For authorization assurance, prior to requesting a funds transfer from the customer account in the amount of the transaction amount, the TSN checks whether the customer financial institution will authorize such funds transfer.

The transaction can occur in a variety of manners. In one  
15 mode of the invention, the transaction can occur while the customer is at the merchant's premises, whereat the customer acquires the merchant identifier and the transaction amount. In another mode, the customer can be at a customer predetermined native location, e.g., at the customer's  
20 home or place of business, where the customer views a merchant's web page. The merchant's web page, in addition to providing the merchant identifier, provides either an advertisement of an invoice (e.g., a utility bill).

For the first mode of the invention, the security feature of the  
25 invention enables the TSN to confirm that the customer wireless communication unit (e.g., mobile station) is within a predetermined geographical proximity of the merchant terminal prior to requesting transfer of the transaction amount from the customer account to the merchant account at the merchant financial institution. The TSN has access to

prestored GPS location coordinates of the merchant terminal, and receives the current GPS coordinates of the customer mobile station from the customer mobile station. The TSN compares the GPS location coordinates of the merchant terminal and the current GPS coordinates of customer  
5 mobile station to determine if the two are within an acceptable proximity range.

For the second mode of the invention, the security feature of the invention enables the TSN to confirm that the customer is in a customer  
10 predetermined native location at the time the customer authorizes payment to the merchant. For example, the geographical security feature would bar any purchases or payment initiated when (1) the mobile station is not connected to base station(s) used when the owner of the mobile station is at one of his customer predetermined native locations, or (2) when GPS  
15 coordinates of the mobile station are not within an acceptable proximity range of the customer predetermined native location.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

The foregoing and other objects, features, and advantages of the invention will be apparent from the following more particular description of  
20 preferred embodiments as illustrated in the accompanying drawings in which reference characters refer to the same parts throughout the various views. The drawings are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the invention.

Fig. 1 is a schematic view of a tele/datacommunications  
25 network including a node which provides a telepayment service according to an embodiment of the invention.

Fig. 1A is a schematic view of a tele/datacommunications network including a node which provides a telepayment service according to another embodiment of the invention.

5 Fig. 1B is a schematic view of a tele/datacommunications network including a service control node of an intelligent network which provides a telepayment service according to an embodiment of the invention.

10 Fig. 2 is a schematic view of the service control node included in the telecommunications network of Fig. 1.

Fig. 2A(1) is a schematic view of the service control node included in the telecommunications network of Fig. 1A for a first mode of  
15 the invention.

Fig. 2A(2) is a schematic view of the service control node included in the telecommunications network of Fig. 1A for a second mode of the invention.

20 Fig. 3 is a schematic view showing the relationship of Fig. 3A, Fig. 3B, and Fig. 3C.

Fig. 3A, Fig. 3B, and Fig. 3C are flowcharts showing steps  
25 executed by a service control node according to the invention.

Fig. 4A is a flowchart showing additional steps executed by a service control node in connection with a security feature of a first mode of the invention.

Fig. 4B is a flowchart showing additional steps executed by a service control node in connection with a security feature of a second mode of the invention.

Fig. 5A is a schematic view of a portion of Fig. 1, but depicting a customer at a merchant's premises.

Fig. 5B is a schematic view of a portion of Fig. 1, but depicting a customer having a mobile station (in the form of a mobile telephone) and a workstation at a customer predetermined native location which is preferably remote from a merchant's premises.

Fig. 5C is a schematic view of a portion of Fig. 1, but depicting a customer having a mobile station (in the form of a laptop computer with mobile termination capabilities), the mobile station situated at a customer predetermined native location which is preferably remote from a merchant's premises.

### **DETAILED DESCRIPTION OF THE DRAWINGS**

In the following description, for purposes of explanation and not limitation, specific details are set forth such as particular architectures, interfaces, techniques, etc. in order to provide a thorough understanding of the present invention. However, it will be apparent to those skilled in the art that the present invention may be practiced in other embodiments that depart from these specific details. In other instances, detailed descriptions of well known devices, circuits, and methods are omitted so as not to obscure the description of the present invention with unnecessary detail.

Fig. 1 shows a telecommunications network 20 having a special function node known as a telepay service node (TSN) 30. Telepay TSN 30 is connected to an exchange, such as transit exchange (TE) 40, of a public switched telephone network (PSTN) 50. PSTN 50 includes both  
5 landline and radio communications links. As such, PSTN 50 provides connections to a plurality of remote wireless units or mobile stations, of which customer mobile station 60 (e.g., a mobile telephone) is but one example, and via landlines to non-mobile units such as merchant terminal 70. Although customer wireless communication unit 60 is hereinafter  
10 illustrated as being a mobile telephone, it should be understood that other types of devices are also contemplated for use with the invention, such as a personal digital assistant (PDA) with a radio connection to PSTN 50 or a computer with mobile termination capabilities.

15 Customer mobile terminal 60 is served by base station (BS) 52 in PSTN 50. Base station 52 is connected to a mobile switching center (MSC) 54 which routes calls from the customer to telepay TSN 30.

Fig. 1 shows telepay TSN 30 as also being connected by a  
20 data network N to a customer financial institution 80 and a merchant financial institution 90. Although illustrated separately, it should be understood that network N can be included in PSTN 50. Moreover, a variety of protocols (e.g. X.25, X.21, leased line and TCP/IP, or internet/TCP/IP) can be utilized over network N.

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While Fig. 5B and Fig. 5C show PSTN 50 and internet 51 directly connected together, the person skilled in the art will appreciate that such illustrations are a simplification for not obscuring salient aspects of the invention. In reality, both data switched networks (such as internet 51)

and circuit switched networks are connected via respective service or gateway nodes to mobile switching centers of a mobile telecommunications network. The mobile telecommunications network comprises not only the mobile stations, but base stations in radio communications with the mobile stations, base station controllers (also known as radio network controllers) in communication with the base stations, and with the mobile switching centers communicating with the base stations controllers.

In accordance with the present invention, a customer who operates customer mobile station 60 seeks to purchase goods or services from a merchant. The merchant has merchant terminal 70 which functions as a computerized cash register and which has modem connection to PSTN 50. The customer via customer mobile station 60 can make payment for the goods or services using telepay TSN 30, and particularly can transfer funds from the customer's account in customer financial institution 80 to the merchant's account in merchant financial institution 90. Customer financial institution 80 can be, for example, a banking institution with which the customer has an account or a credit card company with which the customer has an account.

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The present invention permits financial transactions to occur in a variety of manners. Fig. 5A depicts a first mode of the invention, in which the transaction occurs while the customer is at the merchant's premises 92A. At the merchant's premises 92A the customer acquires the merchant identifier and the transaction amount. Fig. 5B illustrates a second mode of the invention in which the customer is situated at a customer predetermined native location 62B, preferably remote from the merchant's premises 92B. The customer predetermined native location 62B can be, for example, the customer's home or place of business. In accordance with this

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second mode, at the customer predetermined native location 62B the customer views a merchant's web page as displayed on a monitor 64B. The merchant's web page, in addition to providing the merchant identifier, provides either an advertisement of an invoice (e.g., a utility bill). Fig. 5C illustrates a variation of the second mode of the invention in which mobile station 60 takes the form of a laptop computer with mobile termination. The mobile station of Fig. 5C is capable of having connections (through the mobile telecommunications network) both with the internet 51 and with PSTN 50.

In brief, suppose that the customer wants to pay \$100US for a good or service, or for payment of a bill or invoice (such as a utility bill, for example). In accordance with the present invention, the customer merely dials the directory number of the telepay TSN 30 (e.g. a A1-800" directory number) and, in response to prompts generated by telepay TSN 30, enters a merchant identifier and a transaction amount (\$100US). The merchant identifier is provided by the merchant (e.g., prominently displayed at the merchant's premises 92A [see Fig. 5A] or shown on the merchant's web page displayed on monitor 64B [see Fig. 5B] or laptop [see Fig. 5C]). The transaction amount is the total cost for the good or service or bill amount. Telepay TSN 30 sends a verification message to at least one, and preferably both, parties to the transaction. In this regard, telepay TSN 30 sends a verification message to the merchant, providing (e.g., on a cash register display) the transaction amount to be credited to the merchant's account and a transaction code. A similar verification message is sent to customer mobile station 60. If in agreement, both the customer and the merchant then send a verification message to telepay TSN 30. Telepay TSN 30 then arranges for the customer account to be debited, and the merchant account to be credited, by the transaction amount.

In the embodiment illustrated in Fig. 1, telepay TSN 30 is a special purpose node which includes general purpose computer 30C having a UNIX or Microsoft NT operating system and executes a set(s) of coded instructions for performing the actions herein described. Computer 30C is connected to an accessory or peripheral 30P and a data network interface 30D. Peripheral 30P receives and interprets DTMF signalling of numbers (e.g., for transaction amount, merchant identifier, PIN), and also generates and transmits voice/sound prompts. Data network interface 30D is connected via data network N to customer financial institution 80 and to merchant financial institution 90.

In one embodiment of the invention, the set of instructions and functions executed by telepay TSN 30 are modularized. In such embodiment, the modules of telepay TSN 30 as illustrated in Fig. 2 include customer communication module 202; merchant communication module 204; transfer communication module 206; financial institution communication module 208; and, funds authorization module 210.

Customer communication module 202 includes a customer communication interface 202-1 which handles communication with customer mobile station 60 over PSTN 50. Also included in customer communication mode 202 are prompt generator interface 202-2, information collector interface 202-3, verification unit 202-4, and transaction confirmation unit 202-5. Interface 202-2 and 202-3 are connected to peripheral 30P.

Similarly, merchant communication module 204 includes a merchant communication interface 204-1 which handles communications

with merchant terminal 70 over PSTN 50. Also included in merchant communication module 204 are prompt generator interface 204-2; verification unit 204-3; and, transaction confirmation unit 204-4.

5           Transfer coordination module 206 includes a transaction record generator 206-1 and a transaction code generator 206-2. Transaction record generator 206-1 is used to build records for transaction data base 220. In addition to building transaction database 220, transfer coordination module 206 searches for and accesses records stored in transaction database  
10   220.

          Financial institution communication module 208 includes customer financial institution includes customer financial institution interface 208-1 and merchant financial institution interface 208-2.  
15   Financial institution communication module 208 also has a customer search engine 208-3 for searching a customer database 222 and a merchant search engine 208-4 for searching a merchant database 224.

          For the embodiment shown in Fig. 2, customer database 222  
20   has prestored therein a record for each customer who subscribes to the telepay service offered by telepay TSN 30. The record for each customer has at least three fields, including a customer identifier field 222A; a customer financial institution address field 222B; and, a customer account identifier field 222C. The customer account identifier field 222C is the  
25   customer's account number for the particular financial institution whose address appears in field 222B.

          Similarly, the embodiment shown in Fig. 2, customer database 224 has prestored therein a record for each merchant who

participates in the telepay service offered by telepay TSN 30. The record for each merchant has at least three fields, including a merchant identifier field 224A; a merchant financial institution address field 224B; and, a merchant account identifier field 224C. The merchant account identifier field 224C is the merchant's account number for the particular financial institution whose address appears in field 224B.

While databases 220, 222, and 224 have been illustrated in Fig. 2 as being included in telepay TSN 30, it should be understood that such need not necessarily be the case. For example, in an alternate embodiment databases 220, 222, and 224 can be located remotely, e.g., at one or more special nodes such as, for example, service data points (SDPs) of an intelligent telecommunications network.

Actions performed by telepay TSN 30 are understood as described in more detail in connection with Fig. 3A, Fig. 3B, and Fig. 3C and with contextual reference to Fig. 1. In the scenario briefly described above the customer wants to pay \$100US for a good or service. As depicted by event E1 in Fig. 1, the customer merely dials on customer mobile station 60 the directory number of the telepay TSN 30. The call is routed through PSTN 50, which includes mobile base station (BS) 52, and via MSC 54 and SSP 40 to telepay TSN 30, as shown by event E2. At telepay TSN 30, upon initially handling the call customer communications, module 202 obtains a customer identifier (e.g., customer directory number) from the call signaling which sets up the call (see step 300 in Fig. 3A).

Upon completion of the connection, customer communications module 202 directs peripheral 30C (via prompt generator interface 202-2) to issue a series of prompts which are transmitted over the

call connection to customer mobile station 60. The prompts, depicted as event E3 in Fig. 1, are preferably audible prompts and/or displayed text prompts which request either a DTMF response (e.g., for the customer to select digits on the telephone keyboard in response to the prompt) or a voice response. As indicated by step 302 of Fig. 3A, the series of prompts includes a first prompt for entry of the merchant identifier and a second prompt for entry of the transaction amount. For security purposes, a third prompt for a customer personal identification number (PIN) may also be generated. All kinds of additional security functionality can be added either independently or additionally, such as cryptographic keys, fingerprint recognition at the mobile station, etc. Step 320 of Fig. 3A also shows information collector 202-3 of customer communication module 202 obtaining the customer input in response to each of the prompts generated by prompt generator 202-2. In Fig. 1, customer input in response to the prompts is indicated as event E4. The customer input is processed by peripheral 30P.

Upon collection of the information entered on customer mobile station 60 in response to the prompts of step 302, at step 304 the customer communication module 202 sends the information it has gleaned (as processed e.g. by the peripheral 30P) along with the customer identifier to transfer coordination module 206. Transaction record generator 206-1 of transfer coordination module 206 uses the information to build a record in transaction database 220 for the transaction (see step 304 of Fig. 3A). In connection with building the record for the transaction, transaction record generator 206-1 requests and obtains from transaction code generator 206-2 a unique transaction code or identifier for the transaction. Thus far, therefore, the record for the call includes the unique transaction code, the customer identifier, the merchant identifier, and the transaction amount.

At step 306, telepay TSN 30 determines the customer financial institution address and the customer account identifier at the customer financial institution. In particular, at step 306 the transfer coordination module 206 sends to the financial institution communication module 208 a signal which includes the current transaction code, the current customer identifier, and (optionally) the transaction amount. The current customer identifier included in this signal is used by customer search engine 208-3 to search customer data base 222. In particular, customer search engine 208-3 locates a record in data base 222 having the customer identifier in field 222A, and obtains the customer financial institution address and customer account identifier from fields 222B and 222C, respectively, of that record. The customer financial institution address is a telecommunications network directory number of the customer financial institution at which the customer financial institution is contactable and responds to an automatic interrogation and interchange as hereinafter described.

Telepay TSN 30 has, as an optional feature, an ability to assure that the customer account has sufficient funds to cover the transaction amount prior to effecting the transaction. In this regard, and as indicated by step 314, customer financial institution interface 208-1 is directed to send the customer financial institution an authorization assurance request message. The authorization assurance request message is routed by customer financial institution interface 208-1 over data network N to the customer financial institution address obtained at step 314. The authorization assurance request message, indicated as event E5 in Fig. 1, includes the transaction code, the customer account identifier, the transaction amount, and a message type code. The message type

specifically indicates that telepay TSN 30 is seeking to determine whether the customer financial institution 80 will authorize a funds transfer from the customer account in the amount of the transaction amount. Assuming authorization is granted, an authorization assurance message is transmitted  
5 over data network N by customer financial institution 80 to customer financial institution interface 208-1, as depicted by event E6 in Fig. 1.

As indicated by step 316 of Fig. 3A, if the authorization assurance message is negative (indicating that authorization is not granted),  
10 an invalid transaction notification is sent to customer mobile station 60 (see step 318). Otherwise, as shown by step 320, the customer financial institution address and customer account identifier obtained from step 306, along with an indication of receipt of a positive authorization assurance message, are stored in the record for the current transaction in transaction  
15 database 220.

At step 322 the transfer coordination module 206 verifies that a valid merchant identifier was entered and determines the merchant financial institution address and the merchant account identifier at the  
20 merchant financial institution. In like manner as with step 306, at step 322 the transfer coordination module 206 sends a signal to merchant search engine 208-4, the signal including the current transaction code and the current merchant identifier. Merchant search engine 208-4 searches merchant data base 224 for a record having the current merchant identifier  
25 in field 224A. Upon finding such a record, merchant search engine 208-4 obtains the corresponding merchant financial institution address and the merchant account identifier from fields 224B and 224C, respectively, of that record. Then, merchant search engine 208-4 sends a signal to transfer coordination module 206 which includes the current transaction code, the

merchant identifier, and the merchant financial institution address and the merchant account identifier obtained from the thusly located record. Transfer coordination module 206 augments the record for the current transaction with the merchant financial institution address and the merchant account identifier (step 324).

It is noted in passing, that should the merchant identifier not be found in data base 224 upon performance of step 322, an invalid transaction notification is sent to customer mobile station 60. Similarly, if the customer identifier were not located in customer data base 222 at step 306, an invalid transaction notification would be sent to customer mobile station 60.

At step 326, transfer coordination module 206 directs that a transaction verification request message be sent to customer mobile station 60. In this regard, transfer coordination module 206 provides verification unit 202-4 with the current transaction code, the merchant identifier, and the transaction amount. Verification unit 202-4 in turn generates a verification request message which is transmitted to customer mobile station 60 and depicted as event E7 in Fig. 1. Verification request message can take the form of an audible message or, when customer mobile station 60 is suitably equipped, a digital display. The verification request message includes a prompt requesting that the customer verify that the transaction is to proceed.

If the customer agrees with the information provided in the transaction verification request message, the customer responds with an affirmative transaction verification message (as indicated by event E8 in Fig. 1). Step 328 shows receipt of the transaction verification message



from customer mobile station 60. Should it be determined at step 330 that the transaction verification message is negative, the transaction is invalidated and terminated as indicated by step 332.

5                   In like manner with step 326, at step 334 transfer coordination module 206 directs that a transaction verification request message be sent to merchant terminal 70. In this regard, transfer coordination module 206 provides verification unit 204-3 with the current transaction code, the merchant identifier, and the transaction amount.

10       Verification unit 204-3 in turn generates a verification request message which is transmitted to merchant terminal 70 and depicted as event E9 in Fig. 1. This verification request message preferably takes the form of a digital display at merchant terminal 70. The verification request message includes a prompt requesting that the merchant verify that the transaction is

15       to proceed. If the merchant agrees with the information provided in the transaction verification request message, the customer responds with an affirmative transaction verification message (as indicated by event E10 in Fig. 1). Step 336 shows receipt of the transaction verification message from merchant terminal 70. Should it be determined at step 338 that the

20       transaction verification message is negative, the transaction is invalidated and terminated as indicated by step 340.

                  It should be understood that the merchant verification process of steps 334, 336, and 338 can be conducted before or essentially

25       contemporaneous with the customer verification process of steps 326, 328, and 330.

                  Alternatively, in one embodiment a transaction verification request message may be sent only to one party, e.g., to customer mobile station 60 and not to merchant terminal 70.

Assuming that affirmative transaction verification messages are received both from the customer mobile station 60 and merchant terminal 70 in the embodiment currently described, transfer coordination module 206 is so apprised and, at step 342, updates the record for the  
5 current transaction to indicate verification by both parties.

With the transaction approved by both parties, at step 344 transfer coordination module 206 directs the funds transfer authorization  
10 module 210 to authorize initiation of transfer of the transaction amount from the customer account to the merchant account. Along with this directive, funds transfer authorization module 210 is provided the transaction code, the transaction amount, the customer financial institution address, the customer account identifier, the merchant financial institution  
15 address, and the merchant account identifier. As indicated by event E11 in Fig. 1, funds transfer authorization module 210 then signals the customer financial institution 80 over data network N with a funds transfer request message. The signal is sent using the customer financial institution  
interface 208-1 of financial institution communication module 208 (see Fig.  
20 2). The signal includes a message code type indicative of a funds transfer request, the transaction code, the transaction amount, the customer financial institution address, the customer account identifier, the merchant financial institution address, and the merchant account identifier.

25 Upon authorizing initiation of the funds transfer, at step 346 transfer coordination module 206 also directs that a transaction confirmation message be sent to customer mobile station 60 (as event E12) and to merchant terminal 70 (as event E13). The transaction confirmation message is sent to customer mobile station 60 via transaction confirmation

unit 202-5 and to merchant terminal 70 via transaction confirmation unit 204-4.

Step 348 also shows transfer coordination module 206  
5 sending a funds transfer requested notification message to merchant financial institution 90 over data network N. The funds transfer requested notification message alerts institution 90 to expect to receive eventually a transfer of the transaction amount to the merchant account maintained at merchant financial institution 90 from the customer financial institution 80.  
10 Such funds transfer requested notification message is depicted as event E14 in Fig. 1.

Customer financial institution 80 can immediately transfer funds from the customer account to the merchant account at merchant  
15 financial institution 90, e.g., in accordance with usual banking procedures. For sake of simplicity, such transfer is depicted in Fig. 1 as event E15. As an option, customer financial institution 80 can also send to telepay TSN 30 a confirmation that the funds have been transferred from customer financial institution 80 to merchant financial institution 90. Merchant financial  
20 institution 90 in turn credits the merchant account with the transaction amount, which credit may possibly occur after a "float" delay.

The system of Fig. 1A differs from that of Fig. 1 e.g., in that customer mobile station 60 includes a GPS (global positioning system)  
25 communication transponder 62. GPS transponder 62 serves to interrogate a GPS satellite 100 and to obtain therefrom a GPS response which indicates the current GPS coordinates of customer mobile station 60. Event EO of Fig. 1A depicts interrogation and response of GPS satellite 100 by customer mobile station 60. GPS interrogation and response can occur periodically

during activation of customer mobile station 60. Alternatively, customer mobile station 60 can be programmed to interrogate GPS satellite 100 upon detection of the dialing of the digits of the telepayment service of the present invention.

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The current GPS location coordinates of customer mobile station 60 are transmitted to telepay SCP 30 and received by information collector 202-3 of customer communication module 202. Transmission of the current GPS location coordinates can occur in number of ways. For example, upon completion of call connection prompt generator 202 may issue a tone which is recognized by customer mobile station 60 as requiring customer mobile station 60 to send the current GPS location coordinates of customer mobile station 60 to telepay TSN 30. Alternatively, upon completion of call connection, the customer mobile station 60 may (on its own initiative) transmit its current GPS location coordinates at a predetermined time. Regardless of timing and manner of transmission, the transmission of the current GPS location coordinates is governed by the protocol between customer mobile station 60 and telepay TSN 30.

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Fig. 2A(1) shows an embodiment of telepay TSN 30A(1) suitable for the first mode of the invention, i.e., the mode illustrated in Fig. 5A in which the customer's mobile station is proximate the merchant's premises. The telepay TSN 30A(1) of Fig. 2A(1) resembles that of Fig. 2 but in addition includes transaction security module 212A. Further, merchant data base 224 of Fig. 2D contains an additional field for each merchant record, particularly a field 224D. Field 224D has prestored therein the merchant location (GPS) coordinates.

For telepay TSN 30A(1) of Fig. 2A(1), an additional field of

information is obtained at step 306, particularly the merchant location coordinates of field 224D. In performance of its operations, telepay SCP 30 otherwise executes steps similar to those shown in Fig. 3A, Fig. 3B, and Fig. 3C. In addition, telepay TSN 30A(1) executes the steps shown in Fig. 4.

At step 308A of Fig. 4A, transaction security module checks whether customer mobile station 60 is within a predetermined geographical proximity of merchant terminal 70. In particular, transfer communication module 206 passes to transaction security module 212 the merchant GPS location coordinates obtained at step 306 and the current GPS coordinates of customer mobile station 60. Transaction security module 212 then compares the merchant GPS location coordinates obtained at step 306 and the current GPS coordinates of customer mobile station 60. If the two sets of coordinates are not within an acceptable proximity range, transaction security module 212A issues a signal to transfer communication module 206 indicating that the transaction should be invalidated. Transfer communication module 206 responds by notifying the customer of transaction invalidity and by terminating the transaction (step 310A). On the other hand, if the two sets of coordinates are within an acceptable proximity range, transaction security module 212A issues a signal to transfer communication module 206 indicating that the transaction is valid. Transfer communication module 206 then proceeds to the next step, e.g., step 314 of Fig. 3A.

Thus, in the embodiment described in Fig. 1A and Fig. 2A(1), telepay TSN 30 confirms that customer mobile station 60 is within a predetermined geographical proximity of merchant terminal 70 prior to requesting transfer of the transaction amount from the customer account to

the merchant account of the merchant financial institution. The geographical proximity check is a safeguard which precludes purchases unless the customer is actually physically present at the merchant's place of business.

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Fig. 2A(2) shows an embodiment of telepay TSN 30A(1) suitable for the second mode of the invention, i.e., the mode illustrated in Fig. 5B and in Fig. 5C in which the customer's mobile station is at customer's predetermined native location. The telepay TSN 30A(2) of Fig. 2A(2) resembles that of Fig. 2 but in addition includes transaction security module 212B. Further, customer data base 222 of Fig. 2A(2) contains an additional field for each customer record, particularly a field 222D. Field 222D has prestored therein one or more sets of customer location (GPS) coordinates, e.g., the coordinates of the customer's predetermined native location(s).

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For telepay TSN 30A(2) of Fig. 2A(2), an additional field of information is obtained at step 306, particularly the customer location coordinates of field 222D. In performance of its operations, telepay SCP 30A(2) otherwise executes steps similar to those shown in Fig. 3A, Fig. 3B, and Fig. 3C. In addition, telepay TSN 30A(2) executes the steps shown in Fig. 4B.

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At step 308B of Fig. 4B, transaction security module checks whether customer mobile station 60 is within a predetermined geographical proximity of a registered customer predetermined native location. In particular, transfer communication module 206 passes to transaction security module 212 the customer GPS location coordinates obtained at step 306 and the current GPS coordinates of customer mobile station 60.

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Transaction security module 212 then compares the customer GPS location coordinates obtained at step 306 and the current GPS coordinates of customer mobile station 60. If the two sets of coordinates are not within an acceptable proximity range, transaction security module 212B issues a  
5 signal to transfer communication module 206 indicating that the transaction should be invalidated. Transfer communication module 206 responds by notifying the customer of transaction invalidity and by terminating the transaction (step 310B). On the other hand, if the two sets of coordinates are within an acceptable proximity range, transaction security module 212  
10 issues a signal to transfer communication module 206 indicating that the transaction is valid. Transfer communication module 206 then proceeds to the next step, e.g., step 314 of Fig. 3A.

Thus, in the embodiment described in Fig. 1A and Fig. 2A(2),  
15 telepay TSN 30 confirms that customer mobile station 60 is within a predetermined geographical proximity of one of the customer's predetermined native locations prior to requesting transfer of the transaction amount from the customer account to the merchant account of the merchant financial institution. The geographical proximity check is a  
20 safeguard which precludes purchases unless the customer is actually physically present at a location which the customer has previously registered with telepay TSN 30.

While the Fig. 1A and Fig. 2A(1)/2A(2) embodiment of the  
25 invention requires customer presence and/or predetermined location as a security feature, the presence of a credit card or check is not required for the transaction. The only equipment required is the customer mobile station 60. In one embodiment, the invention requires that the customer also know a customer account identifier (PIN) in order to effect the

transaction with a measure of security.

Security based on geographic proximity can also be accomplished in ways other than using GPS technology. For example, geographic location of customer mobile station 60 can be accomplished using very accurate clocks and measuring the radio propagation times for the mobile signal relative to different radio base stations. As another simple but less accurate example, TSN 30 can interrogate the mobile network subscriber database (e.g, a home location register [HLR] in GSM) to inquire as to which MSC and which radio base station is handling the customer's mobile station 60 to determine where customer mobile station 60 is located. Upon receipt of a response to the interrogation, the returned information, being indicative of the geographical location of customer mobile station 60, is compared with the pre-stored location of merchant terminal 70.

In the foregoing embodiments, telepay TSN 30 has been described as a special purpose node which serves as a termination point for call connection from the customer's mobile station 60. In such embodiments, no protocol is employed between MSC 54 and telepay TSN 30. Moreover, telepay TSN 30 includes (or has connected thereto) the intelligent peripheral 30P.

The embodiment of telepay node 30' shown in Fig. 1B, on the other hand, is not a special purpose node but rather a service control point (SCP) of an intelligent network. In the embodiment of Fig. 1, a call made from the customer's mobile station 60 is terminated at mobile switching center (MSC) 54. MSC 54 includes certain service switching function software which enables MSC 54 to function like a service switching point



(SSP). Upon reception of the call from the customer's mobile station 60, MSC 54 signals with telepay TSN 30' using INAP (Intelligent Network Application Part protocol) over CCITT signaling system No. 7. For this reason, what was shown in Fig. 1 as a single event E2 is shown in Fig. 1B as event E2A (call connection from customer mobile station 60 to MSC 54) and event E2B (signaling from MSC 54 to telepay TSN 30').

Thus, the embodiment of Fig. 1B differs from those previously described in that MSC 54 serves as the call connection node, and communication between MSC 54 and telepay TSN 30' occurs by signaling. Such being the case, in the embodiment of Fig. 1B, no intelligent peripheral 30P is provided at telepay TSN 30, but is instead moved to MSC 54 where it appears as peripheral 54P. When prompts such as tone and/or voice prompts are directed by telepay TSN 30' as is indicated by event E3A, such directives are transmitted by signaling to MSC 54, and then to intelligent peripheral 54P. Intelligent peripheral 54P then generates the prompts for application (e.g., event E3B) to the intended recipient e.g., mobile station 60. Similarly, intelligent peripheral 54P interprets any DTMF tones inputted by the customer (e.g., PIN) at event E4A, whereupon the interpreted information (e.g., PIN) is signaled as event E4B from MSC 54 to telepay TSN 30'. Although not expressly shown in Fig. 1B, it should be understood that subsequent communications with customer mobile station 60, as well as merchant terminal 70 (e.g., verification and response), are accomplished using signaling between MSC 54 and telepay TSN 30'.

The embodiment of Fig. 1B is also optionally implemented using the above-described security features, such as GPS, for example. Such implementation is readily ascertained from the preceding discussions.

Whereas the embodiments of Fig. 1 and Fig. 1A are simple and perhaps less expensive to implement in low traffic situations, the embodiment of Fig. 1B has greater capacity and scalability.

5 All embodiments herein described can be realized on a general computer with UNIX or Windows NT, or other general purpose operating system based on special purpose computers, such as the Ericsson APZ Telecom Purpose Computer, for example. For implementation in a European country, for example, the telepay TSN nodes can communicate in  
10 MAP protocol to the GSM HLR database, over signaling no. 7 (SS7) or TCP/IP, for example.

The present invention can be enhanced using encryption techniques for communications between telepay TSN 30 on the one hand  
15 an customer mobile station 60 and merchant terminal 70 on the other. Encryption can be accomplished, for example, using a SIM (subscriber identification mobile) card in customer mobile station 60 and a similar encryption card at customer terminal 70.

20 Further, the SIM (subscriber identification mobile) card utilized by customer mobile station 60 of the present invention can also serve as a credit card, in which case payment can be debited to the customer's credit card account or telephone bill. In this regard, the SIM card has the customer's account number stored therein, which account  
25 number can be automatically communicated by customer mobile station unit 60 to telepay TSN 30. For example, telepay TSN 30 can issue a special interrogation (e.g., a message in the signaling link to the mobile station or a tone) to customer mobile station unit 60 which is detected and interpreted by the SIM card, and to which the SIM card causes station 60 to

respond automatically with the customer's account stored in the SIM card. In the case of such prestorage of customer account information in a SIM card, there need be no look up at telepay TSN 30 for the customer's account number. A database look up process can be utilized to determine a network address for the financial institution which administers the account. Telepay TSN 30 can then provide the transaction amount and customer account number to the financial institution, whereupon the financial institution prepares an appropriate statement (e.g., credit card statement or telephone bill) which includes the transaction amount.

Prompts utilized by telepay TSN 30, such as those for entry of data (e.g., transaction amount, merchant identifier) and verification, can utilize short message service features for the display of text on telephones and terminals having suitable display units. For short message service (SMS), telepay TSN 30 signals either a SMS server (provided in GSM or equivalent systems) or the home location register (HLR). Alternatively, in an intelligent network environment, telepay TSN 30' can signal a SCP, which in turn can signal the SMS server or HLR, which in turn signal the MSC 54 for contacting the mobile station or terminal.

In some embodiments the customer line identity (e.g., calling party's directory number) is used as the customer's billing number, or alternatively is used to look up (in a database) an account number corresponding to the customer line identity. In most modern networks such as ISDN, the customer line identity (CLI) is signaled all the way through to the end user equipment, thereby facilitating such services as Calling Line Identification ("Caller ID"). Accordingly, one implementation for debiting the mobile customer is to get the CLI directly if an appropriate signaling protocol is used to telepay TSN 30 (for TSN 30 not being an SCP-type

node). If telepay TSN 30 is a SCP-type node, the SSP obtains the mobile number (CLI) via the network signaling (e.g., ISUP or TUP protocols according to ITU standards) and sends the CLI to the SCP via the INAP protocol. Thus, telepay TSN 30 does not have to interrogate the customer  
5 mobile unit 60 for its account number.

In addition to the security features described above, a protocol specific to each mobile standard on top of signaling no. 7 interface (or TCPIP or X.25) to mobile network can be employed to connect to  
10 different databases that can give useful information on the mobile handset and its owner, i.e. whether the handset is a valid subscriber, if it has been reported stolen, which radio cells its signal is received by, signal strength and cell locations (in GSM e.g. Home Location Register, Equipment Identity Register, Authentication Centre). This information can also be  
15 used as data to validate the transaction -- e.g. a stolen handset can not pay for purchases, and a handset can not verify a purchase in a shop in New York if the radio cell to which it is connected is in San Francisco.

In the embodiments of Fig. 5B and Fig. 5C, the merchant's  
20 web page is generated and transmitted by a web server 71 (which may, or may not, be at the merchant's premises). The mechanics of Web page generation and transmission is not germane to the present invention. Standard internet protocols and security functionality can be employed. The information conveyed on the Web page is pertinent, in that such  
25 information either presents or enables the customer to acquire financial information in the nature of e.g., an advertisement or a bill. The advertisement may provide a description of a product or service, as well as a cost (transaction amount) and a merchant identifier, and perhaps a transaction code or the like to identify the particular advertised item or bill

(invoice) number or account number.

As one example, in the manner illustrated in Fig. 5B, at home a customer on computer 64 may reach the Web page of a utility company in order to pay, for example, a utility bill. By entering the customer's name or account number with the utility company (and possibly a PIN or the like for security reasons), the customer is linked to a display of the customer's present utility bill. The display provides the transaction amount (current balance due), as well as a merchant identifier and possibly a transaction code. The customer then dials the Telepay TSN number using the customer's mobile station 60, and in response to prompts enters e.g., the merchant identifier and transaction amount (and possibly the transaction code). If the customer is situated at one of the customer's predetermined native locations, the transaction is completed in the manner described herein.

In the embodiment of Fig. 5C, both internet access and access to Telepay TSN 30 are accomplished using mobile station 60 in the form of laptop computer 60 with mobile termination. In this embodiment, laptop computer 60 and the mobile network are capable of having multiple connections between the network and a mobile station.

The present invention thus facilitates funds transfer for payment of goods and/or services without use of a credit card, bank check or the like; is essentially immediate, simple, and secure.

While the invention has been particularly shown and described with reference to the preferred embodiments thereof, it will be understood by those skilled in the art that various alterations in form and

detail may be made therein without departing from the spirit and scope of the invention.

**WHAT IS CLAIMED IS: \_\_\_\_\_**

- 1           1. A method of facilitating automated payment from a customer  
2     account of a customer financial institution to a merchant account of a  
3     merchant financial institution, the method including:  
4           acquiring a merchant identifier and transaction amount from a  
5     customer mobile station;  
6           verifying the transaction amount with a merchant terminal; and  
7           upon receipt of a verification from the merchant terminal, requesting  
8     transfer of the transaction amount from the customer account to the  
9     merchant account.
- 1           2. The method of claim 1, further comprising consulting a customer  
2     data base wherein is stored for the customer (1) a telecommunications  
3     address of the customer financial institution and (2) a customer account  
4     identifier.
- 1           3. The method of claim 1, further comprising consulting a merchant  
2     data base wherein is stored for the merchant identifier (1) a  
3     telecommunications address of the merchant financial institution and (2) a  
4     merchant account identifier.
- 1           4. The method of claim 1, further comprising determining whether  
2     the customer mobile station and the merchant terminal are within a  
3     predetermined geographical proximity, and wherein transfer of the  
4     transaction amount from the customer account to the merchant account is  
5     precluded unless the customer mobile station and the merchant terminal are  
6     within the predetermined geographical proximity.

1           5. The method of claim 4 further comprising obtaining geographic  
2 coordinates of the customer mobile station, and comparing the geographic  
3 coordinates of the customer mobile station with geographic coordinates of  
4 the merchant terminal to determine whether the customer mobile station  
5 and the merchant terminal are within the predetermined geographical  
6 proximity.

1           6. The method of claim 1, further comprising determining whether  
2 the customer mobile station is situated at a customer predetermined native  
3 location, wherein transfer of the transaction amount from the customer  
4 account to the merchant account is precluded unless the customer mobile  
5 station is at the customer predetermined native location.

1           7. The method of claim 1, wherein the merchant identifier is  
2 acquired from a display on a computer screen.

1           8. The method of claim 7, wherein the merchant identifier is  
2 acquired from a web page.

1           9. The method of claim 1, wherein the merchant identifier is  
2 acquired from a display on a computer screen, the computer screen being  
3 situated at a customer predetermined native location.

1           10. The method of claim 9, further comprising determining whether  
2 the customer mobile station is situated at the customer predetermined native  
3 location, wherein transfer of the transaction amount from the customer  
4 account to the merchant account is precluded unless the customer mobile  
5 station is at the customer predetermined native location.



1           11. The method of claim 1, further comprising telephonically  
2     interfacing with a data base at the customer financial institution to  
3     determine whether debiting of the customer account by the transaction  
4     amount is authorized.

1           12. A method for facilitating automated funds transfer of a  
2     transaction amount, the method comprising:  
3           determining, at a service node of a telecommunications network,  
4     whether: (1) a customer mobile station and a merchant terminal are within  
5     a predetermined geographical proximity; or (2) the customer mobile station  
6     is situated at a customer predetermined native location; and  
7           in response to the determining, arranging, at the service node and in  
8     response to a request from the customer mobile station, transfer of the  
9     transaction amount from a customer account of the customer financial  
10    institution to a merchant account of the merchant financial institution.

1           13. The method of claim 12, further comprising using a merchant  
2     identifier provided on a display on a computer screen for ascertaining the  
3     merchant account.

1           14. The method of claim 13, wherein the merchant identifier is  
2     acquired from a web page.

1           15. A method for facilitating automated funds transfer of a  
2     transaction amount, the method comprising:  
3           determining, at a service node of a telecommunications network,  
4     whether: (1) a customer mobile station and a merchant terminal are within  
5     a predetermined geographical proximity; (2) the customer mobile station is  
6     situated at a customer predetermined native location; and

7           in response to the determining, arranging, at the service node and in  
8   response to request from the customer mobile station, for a credit message  
9   to be sent to a merchant account of the merchant financial institution and a  
10   debit message to be sent to a customer account of the customer financial  
11   institution.

1           16. The method of claim 15, further comprising using a merchant  
2   identifier provided on a display on a computer screen for ascertaining the  
3   merchant account.

1           17. The method of claim 16, wherein the merchant identifier is  
2   acquired from a web page.

1           18. A telecommunications service for facilitating funds transfer of a  
2   transaction amount, the service comprising:  
3       a customer mobile station;  
4       a merchant terminal;  
5       a customer financial institution;  
6       a merchant financial institution;  
7       a service node which, in response to a request from the customer  
8   mobile station, arranges for transfer of the transaction amount from a  
9   customer account of the customer financial institution to a merchant  
10   account of the merchant financial institution provided that the service node  
11   determines at least one of the following: (1) that the customer mobile  
12   station and the merchant terminal are within a predetermined geographical  
13   proximity; and (2) that the customer mobile station is situated at a  
14   customer predetermined native location; and  
15       a mobile switching center connected to the service node, to the  
16   customer mobile station, and to the merchant terminal; and,

17           a data network which connects the service node to the customer  
18 financial institution and to the merchant financial institution

1           19. The system of claim 18, further comprising using a merchant  
2 identifier provided on a display on a computer screen for ascertaining the  
3 merchant account.

1           20. The system of claim 19, wherein the merchant identifier is  
2 acquired from a web page.

1           21. A service node of a telecommunications network which, in  
2 response to a request from a customer mobile station, arranges for transfer  
3 of a transaction amount from a customer account of the customer financial  
4 institution to a merchant account of merchant financial institution provided  
5 that the service node determines that the customer mobile station and the  
6 merchant terminal are within a predetermined geographical proximity

1           22. A service node of a telecommunications network which, in  
2 response to a request from a customer mobile station, arranges for transfer  
3 of a transaction amount from a customer account of the customer financial  
4 institution to a merchant account of merchant financial institution provided  
5 that the service node determines that the customer mobile station is at a  
6 customer predetermined native location

1           23. A telecommunications service for facilitating funds transfer of a  
2 transaction amount, the service comprising:  
3           a customer mobile station which includes a subscriber identification  
4 mobile card, the subscriber identification mobile card having stored therein  
5 a customer account number;

6           a merchant terminal;  
7           a customer financial institution;  
8           a merchant financial institution;  
9           a service node which, upon receiving a call from the customer  
10 mobile station:  
11           (1) acquires a merchant identifier, transaction amount, and the  
12 customer account number from the customer mobile station;  
13           (2) verifies the transaction amount with at least one of the customer  
14 mobile station and the merchant terminal; and  
15           (3) upon receipt of a verification, requests  
16 crediting of the transaction amount to a merchant account of the  
17 merchant financial institution and debiting of the transaction amount to the  
18 customer account;  
19           a mobile switching center connected to the service node, to the  
20 customer mobile station, and to the merchant terminal; and,  
21           a data network which connects the service node to the customer  
22 financial institution and to the merchant financial institution

1           24. The service of claim 23, wherein the customer account number  
2 is one of a customer credit card account or a customer telephone bill  
3 account.

1           25. The service of claim 23, further comprising using information  
2 obtained on a display on a computer screen as the merchant identifier  
3 provided and for ascertaining the merchant account.

1           26. The system of claim 25, wherein the information is acquired  
2 from a web page.

1           27. A telecommunications service for facilitating funds transfer of a  
2 transaction amount, the service comprising:  
3           a customer mobile station;  
4           a merchant terminal;  
5           a customer financial institution;  
6           a merchant financial institution;  
7           a service node which, in response to a call from the customer mobile  
8 station:  
9           (1) acquires a merchant identifier and transaction amount from the  
10 customer mobile station;  
11           (2) verifies the transaction amount with the merchant terminal; and  
12           (3) upon receipt of a verification, requests transfer of the transaction  
13 amount from the customer account to a merchant account of the merchant  
14 financial institution; and  
15           a mobile switching center connected to the service node, to the  
16 customer mobile station, and to the merchant terminal; and,  
17           a data network which connects the service node to the customer  
18 financial institution and to the merchant financial institution

1           28. The apparatus of claim 27, wherein the service node determines  
2 whether the customer mobile station and the merchant terminal are within a  
3 predetermined geographical proximity prior to requesting transfer of the  
4 transaction amount from the customer account to the merchant account of  
5 the merchant financial institution.

1           29. The apparatus of claim 28, further wherein the service node  
2 obtains geographic coordinates of the customer mobile station, and wherein  
3 the service node compares the geographic coordinates of the customer  
4 mobile station with geographic coordinates of the merchant terminal to

5 determine whether the customer mobile station and the merchant terminal  
6 are within a predetermined geographical proximity

1 30. The apparatus of claim 27, further comprising a transaction  
2 security module which determines whether the customer mobile station is  
3 situated at a customer predetermined native location, and wherein transfer  
4 of the transaction amount from the customer account to the merchant  
5 account is precluded unless the customer mobile station is at the customer  
6 predetermined native location.

1 31. The apparatus of claim 27, further comprising a customer data  
2 base wherein is stored for the customer (1) a telecommunications address of  
3 the customer financial institution and (2) a customer account identifier.

1 32. The apparatus of claim 27, further comprising a merchant data  
2 base wherein is stored for the merchant identifier (1) a telecommunications  
3 address of the merchant financial institution and (2) a merchant account  
4 identifier.

1 33. The apparatus of claim 27, wherein the service node  
2 communicates with the customer financial institution to determine whether  
3 debiting of a customer account by the transaction amount is authorized.

1 34. The apparatus of claim 33, wherein information ascertained  
2 from a display on a computer screen is used as the merchant identifier.

1 35. The apparatus of claim 34, wherein the information is acquired  
2 from a web page.

1           36. A node of a telecommunications network which facilitates  
2 payment from a customer account of a customer financial institution to a  
3 merchant account of a merchant financial institution, the node comprising:  
4           a customer communication module which requires a merchant  
5 identifier and transaction amount from a customer mobile station;  
6           a merchant communication module which verifies the transaction  
7 amount with a merchant terminal; and  
8           a funds transfer authorization module which, upon receipt by the  
9 merchant communication module of a verification from the merchant  
10 terminal, requests transfer of the transaction amount from the customer  
11 account to the merchant account.

1           37. The apparatus of claim 36, wherein the node is a service control  
2 point of an intelligent telecommunications network.

1           38. The apparatus of claim 36, wherein the node is a special  
2 function node.

1           39. The apparatus of claim 36, further comprising a customer data  
2 base wherein is stored for the customer (1) a telecommunications address of  
3 the customer financial institution and (2) a customer account identifier.

1           40. The apparatus of claim 36, further comprising a merchant data  
2 base wherein is stored for the merchant identifier (1) a telecommunications  
3 address of the merchant financial institution and (2) a merchant account  
4 identifier.

1           41. The apparatus of claim 36, further comprising a transaction  
2 security module which determines whether the customer mobile station and

3 the merchant terminal are within a predetermined geographical proximity,  
4 and wherein transfer of the transaction amount from the customer account  
5 to the merchant account is precluded unless the customer mobile station  
6 and the merchant terminal are within the predetermined geographical  
7 proximity.

1 42. The apparatus of claim 41, wherein the transaction security  
2 module obtains geographic coordinates of the customer mobile station, and  
3 wherein the transaction security module compares the geographic  
4 coordinates of the customer mobile station with geographic coordinates of  
5 the merchant terminal to determine whether the customer mobile station  
6 and the merchant terminal are within the predetermined geographical  
7 proximity.

1 43. The apparatus of claim 36, further comprising a transaction  
2 security module which determines whether the customer mobile station is  
3 situated at a customer predetermined native location, and wherein transfer  
4 of the transaction amount from the customer account to the merchant  
5 account is precluded unless the customer mobile station is at the customer  
6 predetermined native location.

1 44. The apparatus of claim 36, further comprising a financial  
2 institution module which communicates with the customer financial  
3 institution to determine whether debiting of the customer account by the  
4 transaction amount is authorized.



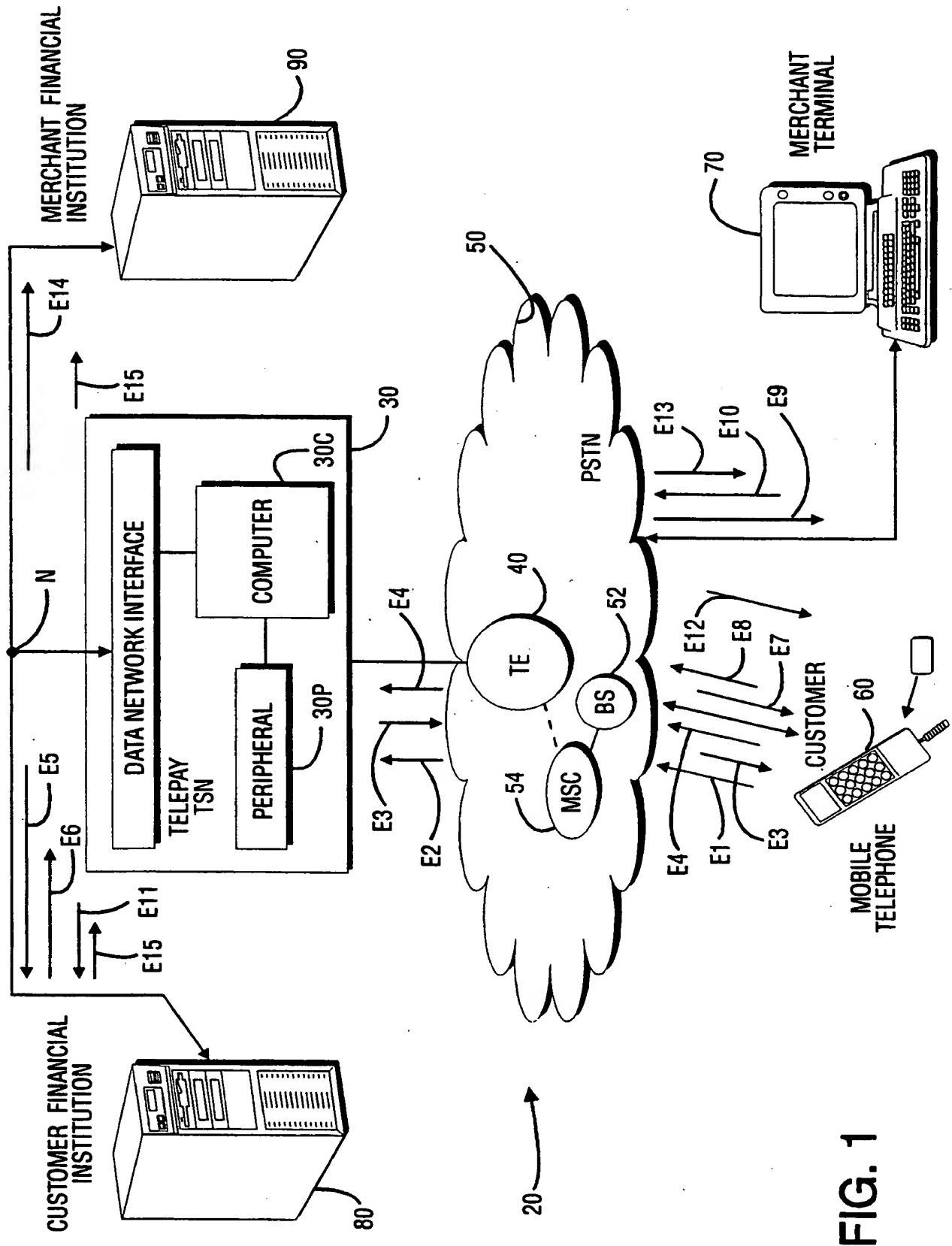


FIG. 1

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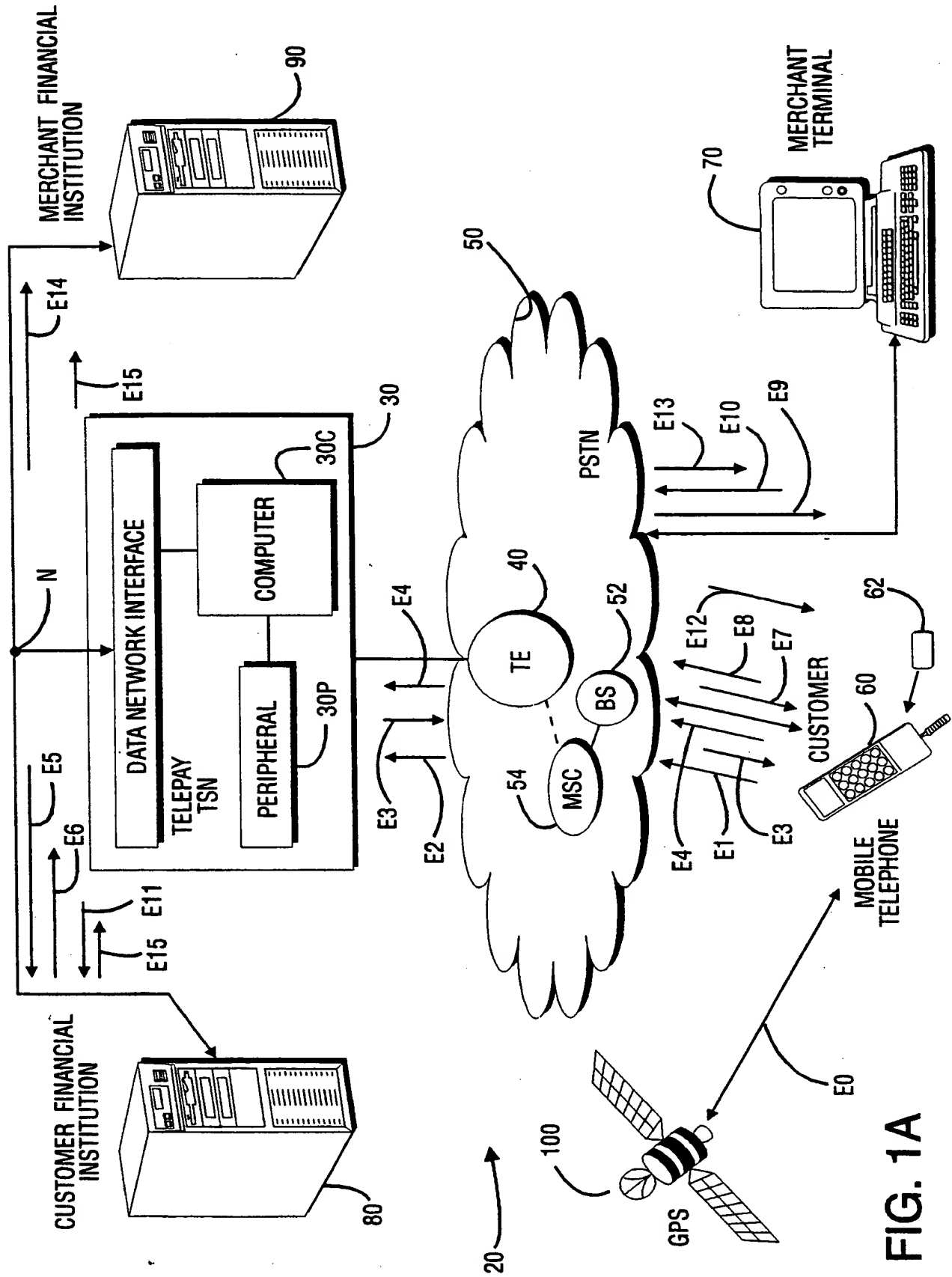


FIG. 1A

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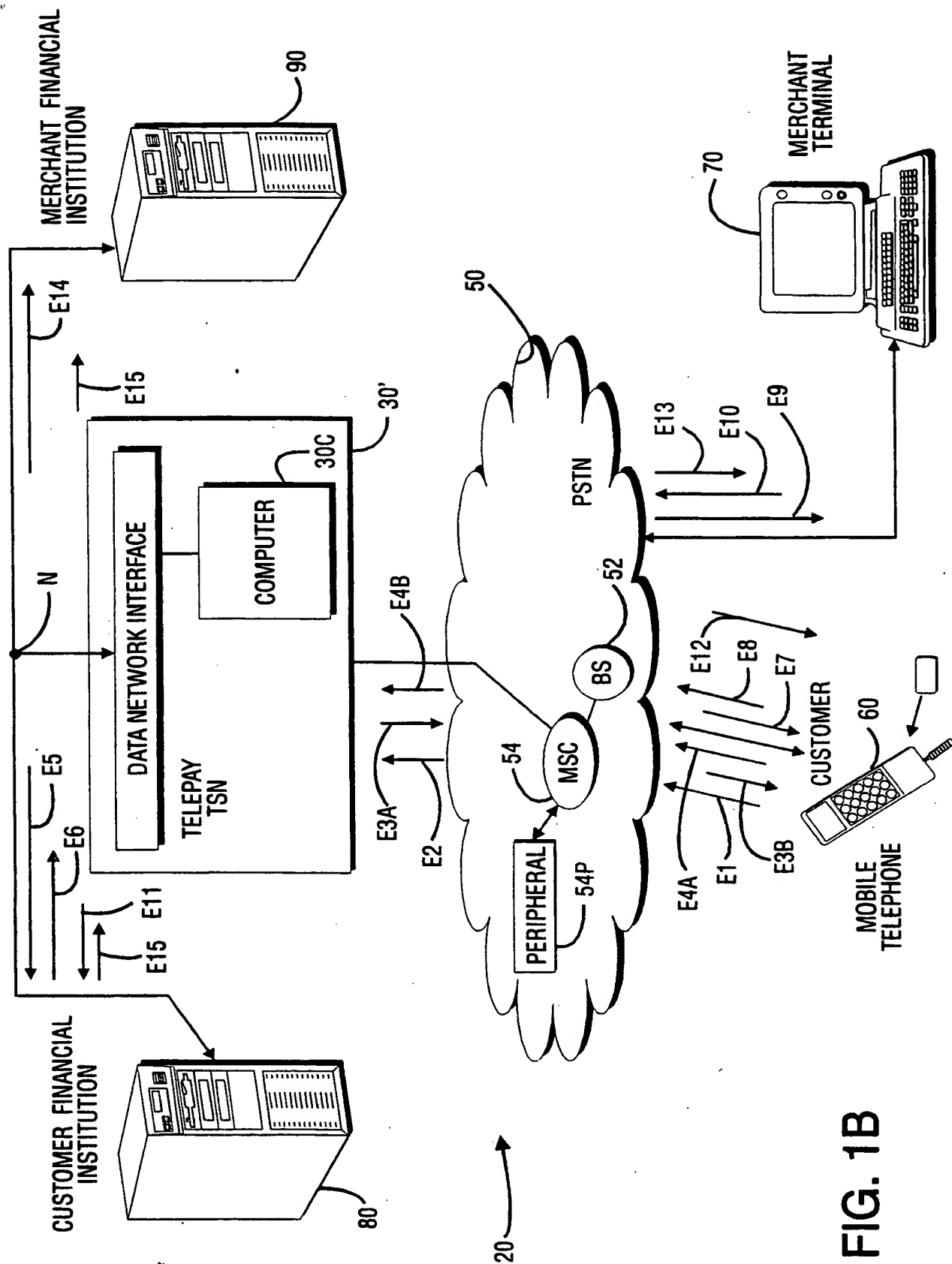


FIG. 1B

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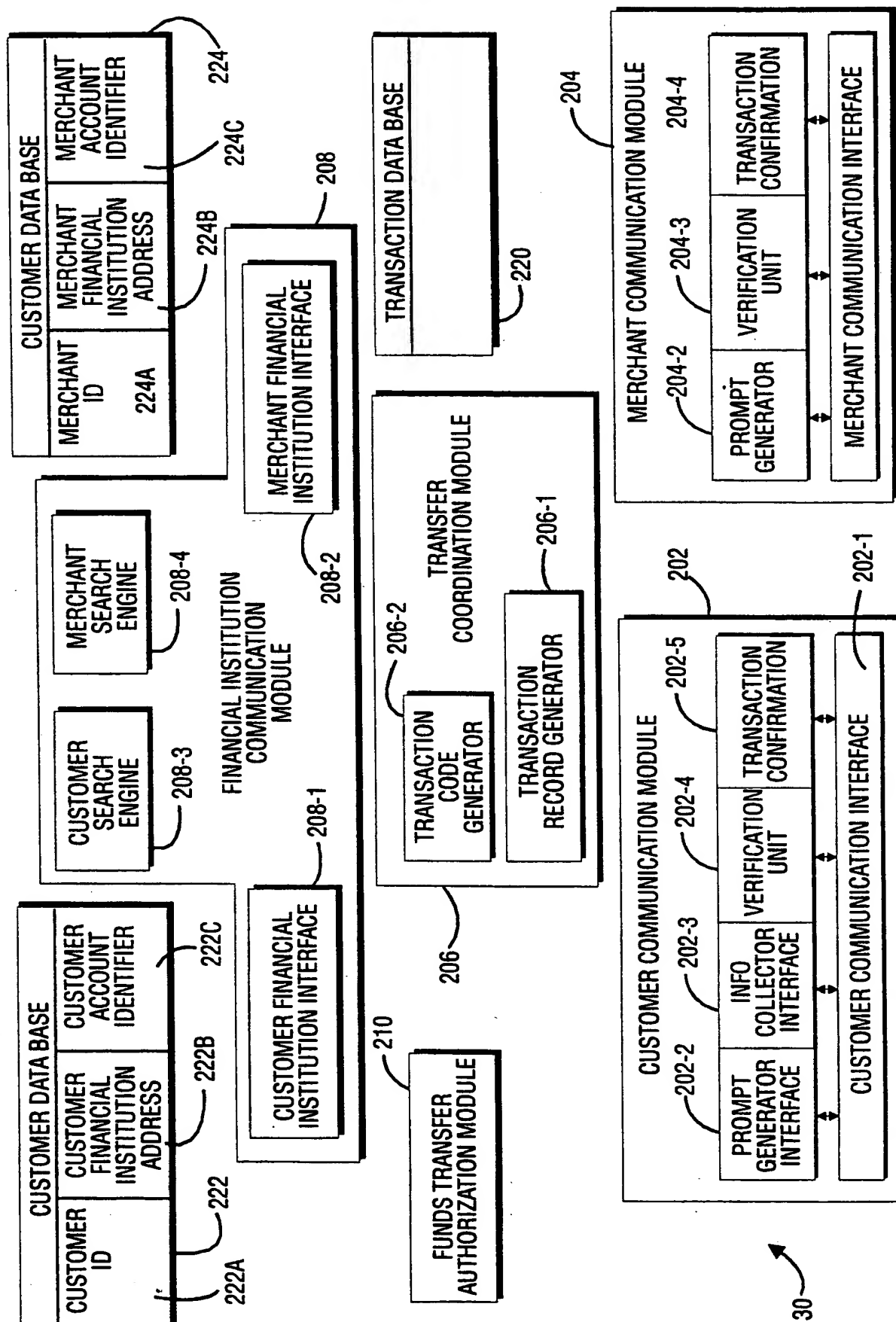


FIG. 2

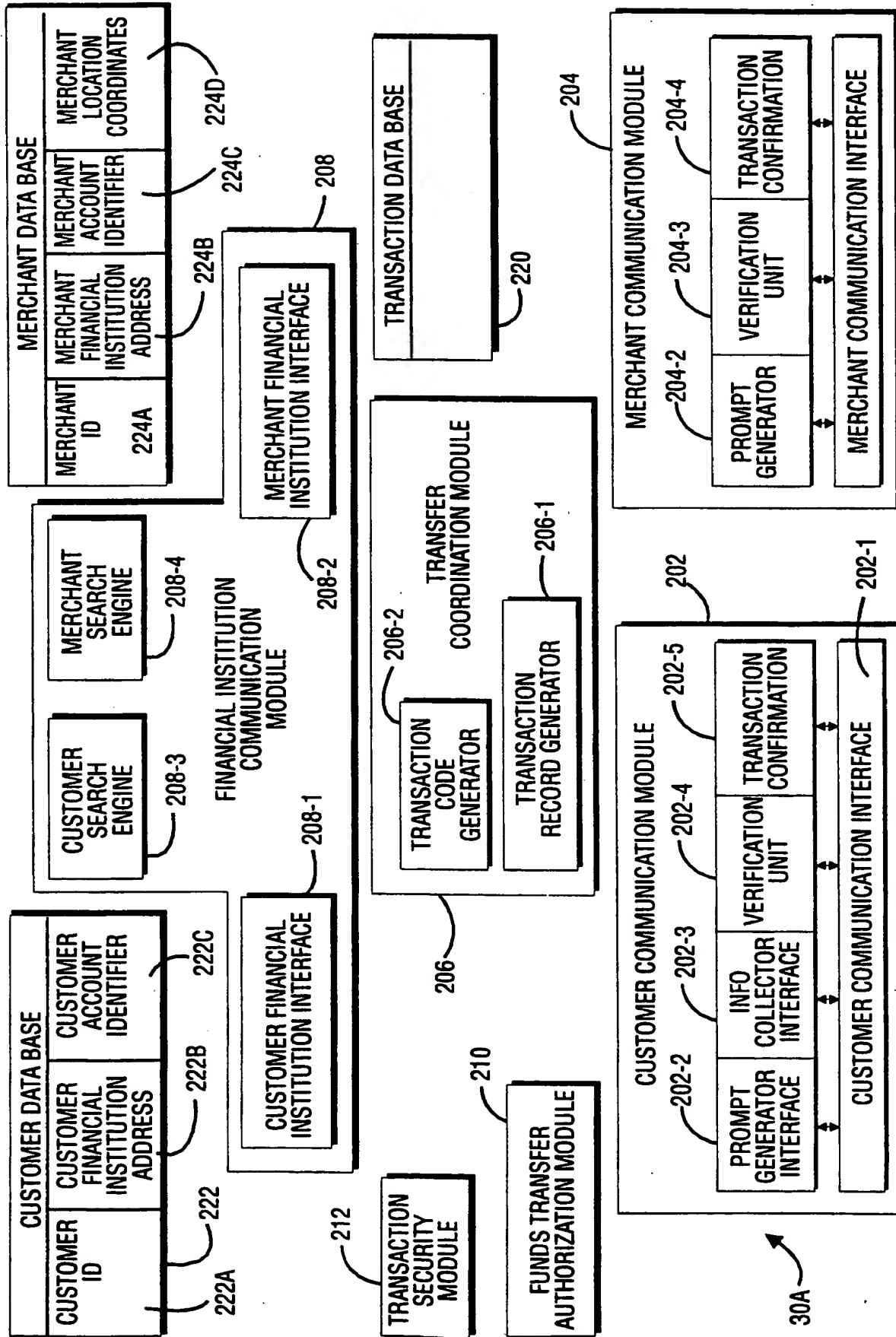


FIG. 2A

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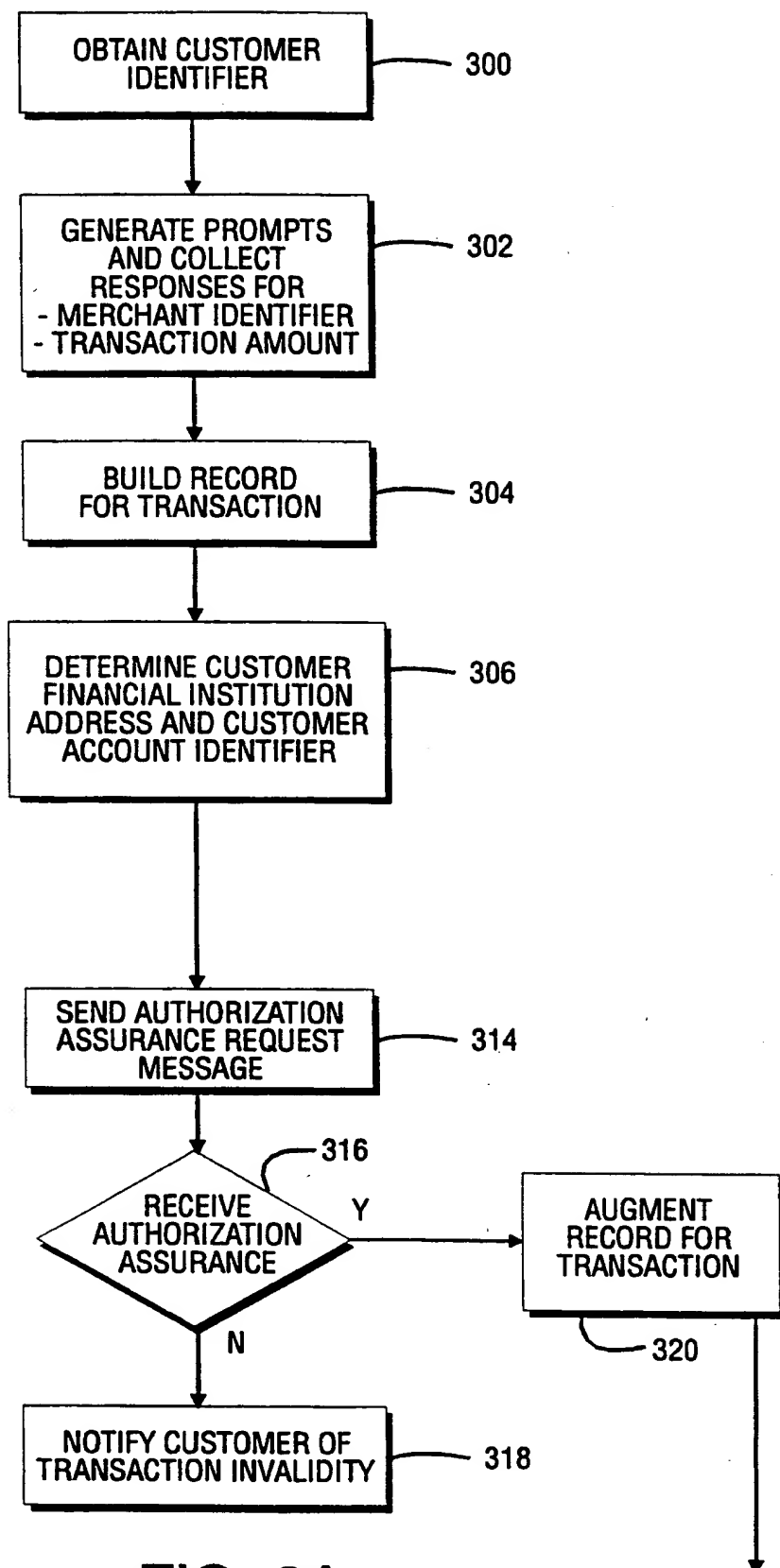


FIG. 3A

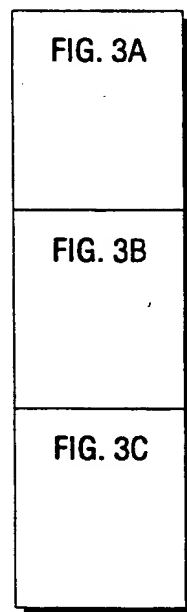


FIG. 3

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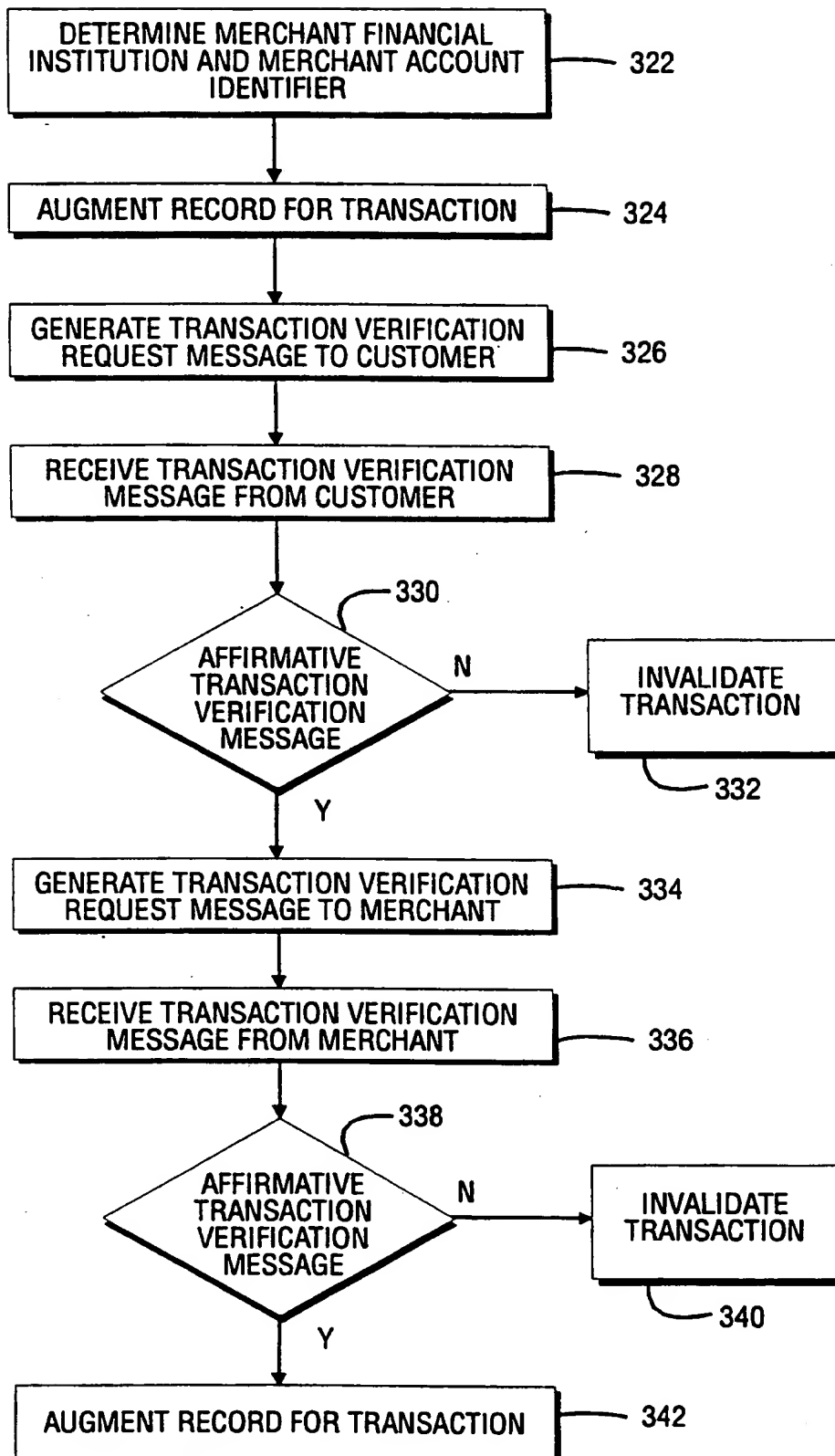


FIG. 3B

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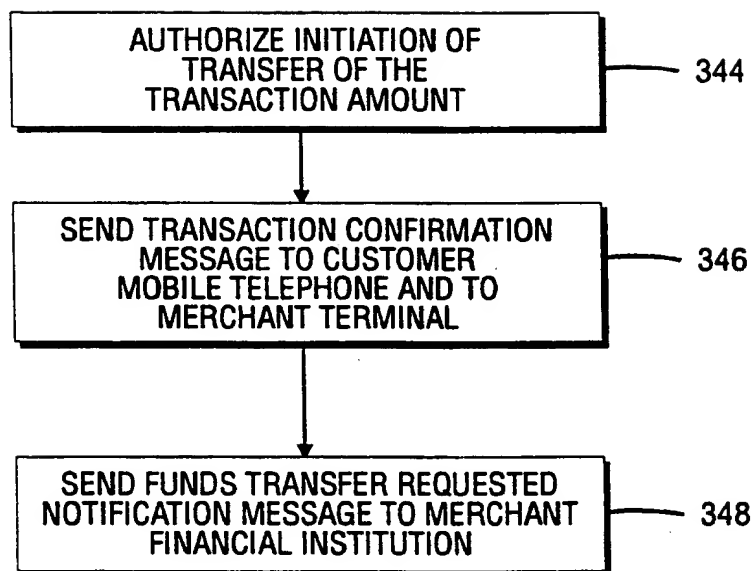


FIG. 3C



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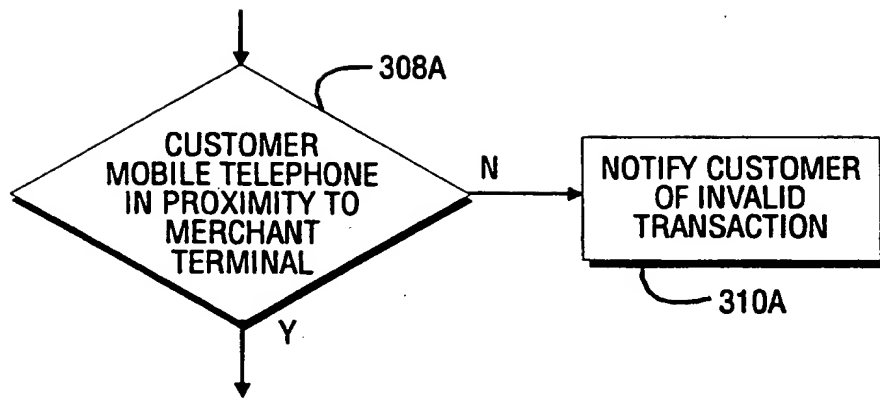


FIG. 4A

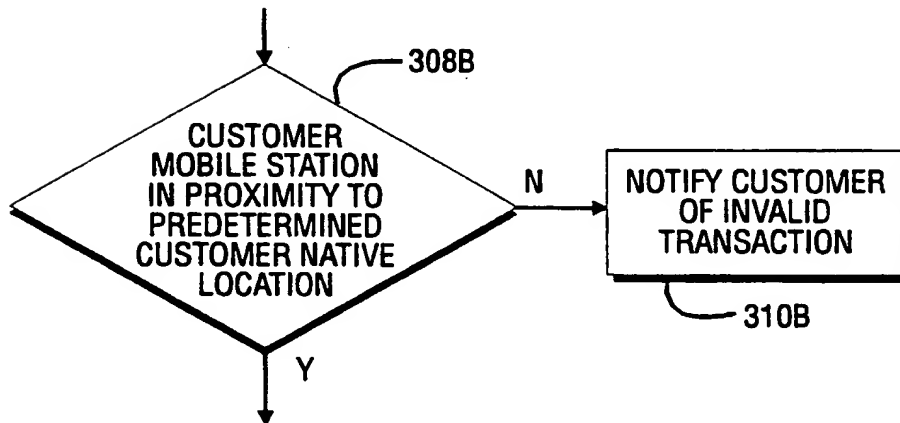


FIG. 4B

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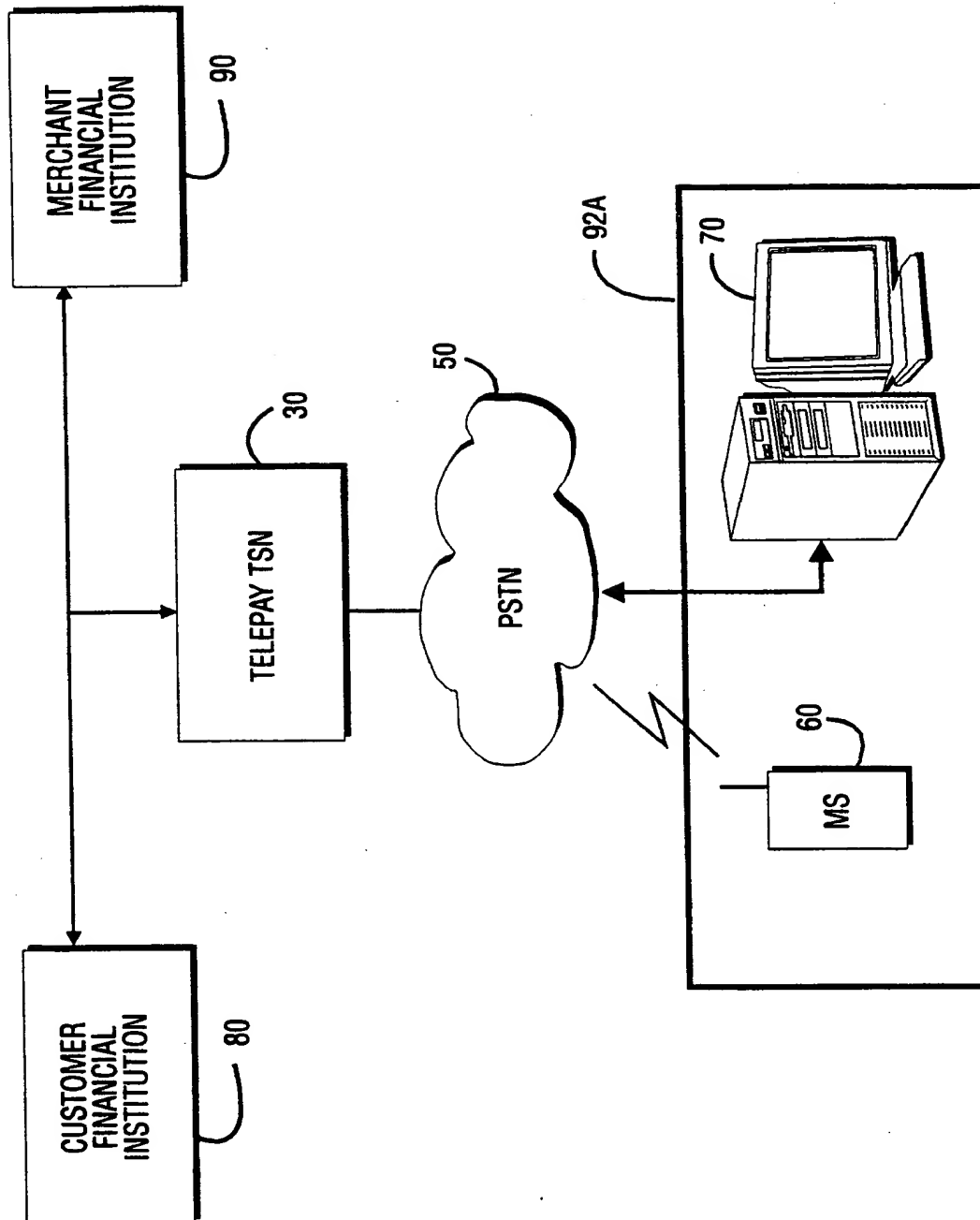
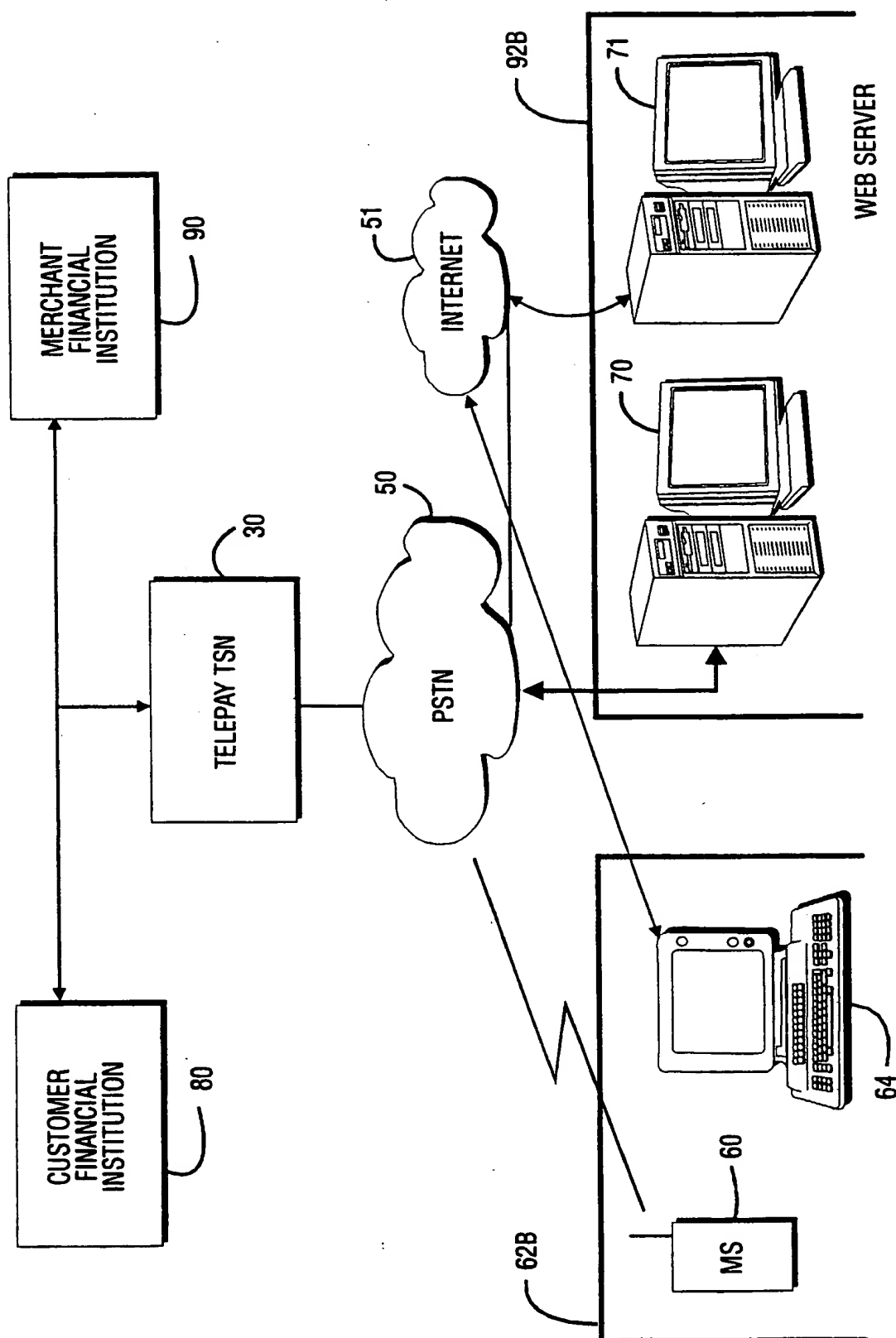


FIG. 5A



**FIG. 5B**

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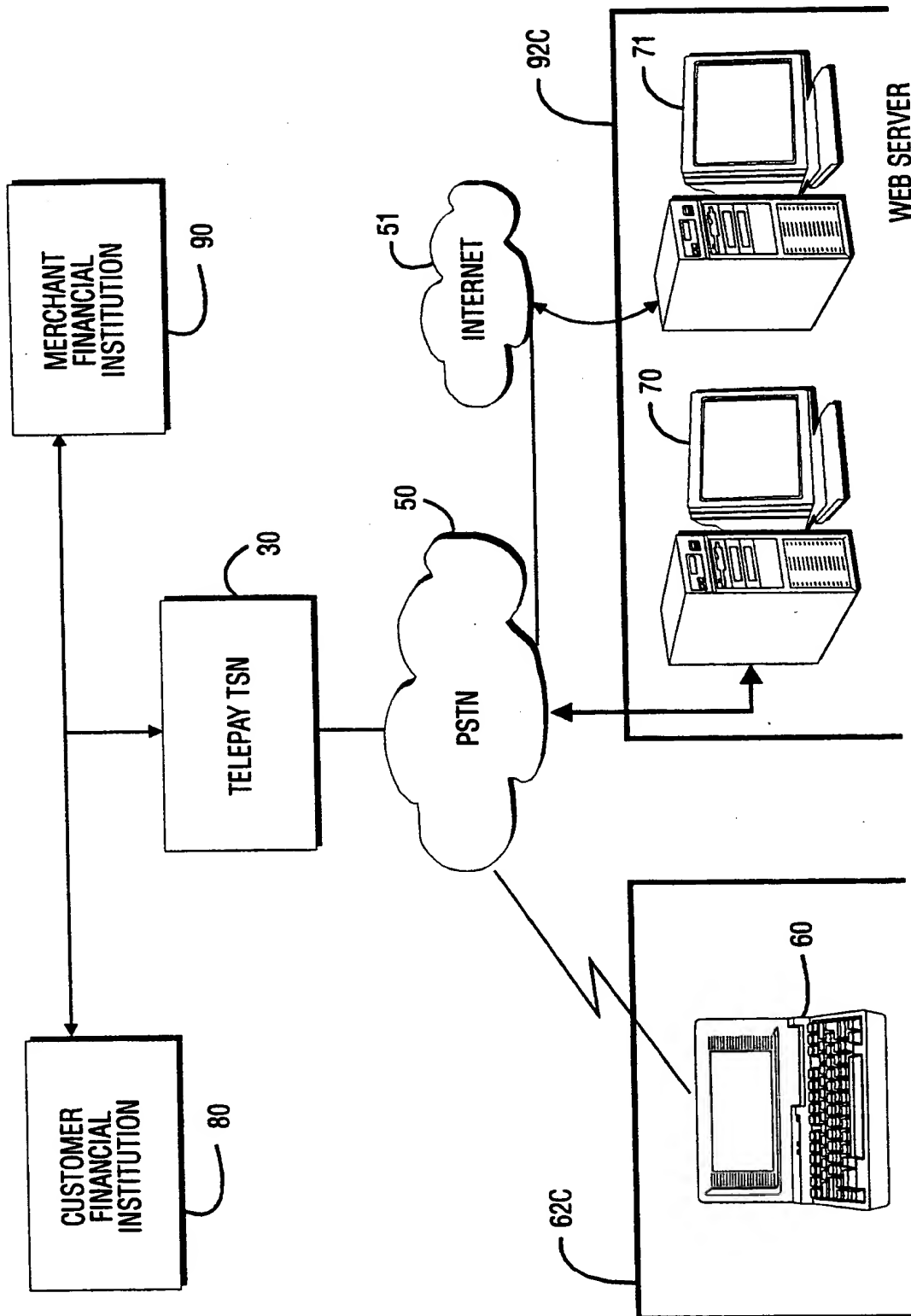


FIG. 5C

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/SE 98/00691

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 G07F19/00 H04M17/00 G06F17/60

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 G07F H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	EP 0 708 547 A (AT & T) 24 April 1996  see abstract; claims; figures 1-4 see column 1, line 32 - column 2, line 12 see column 2, line 55 - column 4, line 5 see column 5, line 33 - column 6, line 41	1, 11, 23, 27, 33, 36, 44 12, 15, 18
Y A	EP 0 501 697 A (AMERICAN TELEPHONE AND TELEGRAPH) 2 September 1992  see abstract; claims; figures 1, 6  see column 13, line 13 - column 16, line 34  ---	1, 11, 23, 27, 33, 36, 44 12, 15, 18, 21, 22, 24, 37, 38
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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Date of the actual completion of the international search

2 September 1998

Date of mailing of the international search report

10/09/1998

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

David, J

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/SE 98/00691

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Information on patent family members

International Application No

PCT/SE 98/00691

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